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Drug and Cosmetic Industry

December 1955 Vol. 77 No. 6

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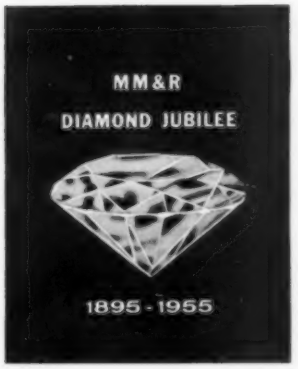

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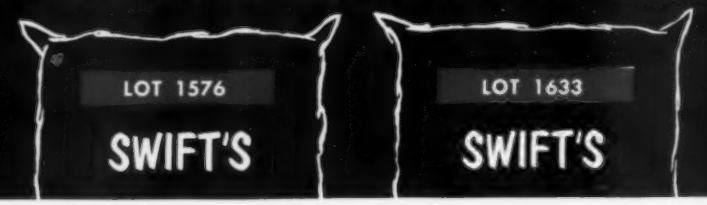

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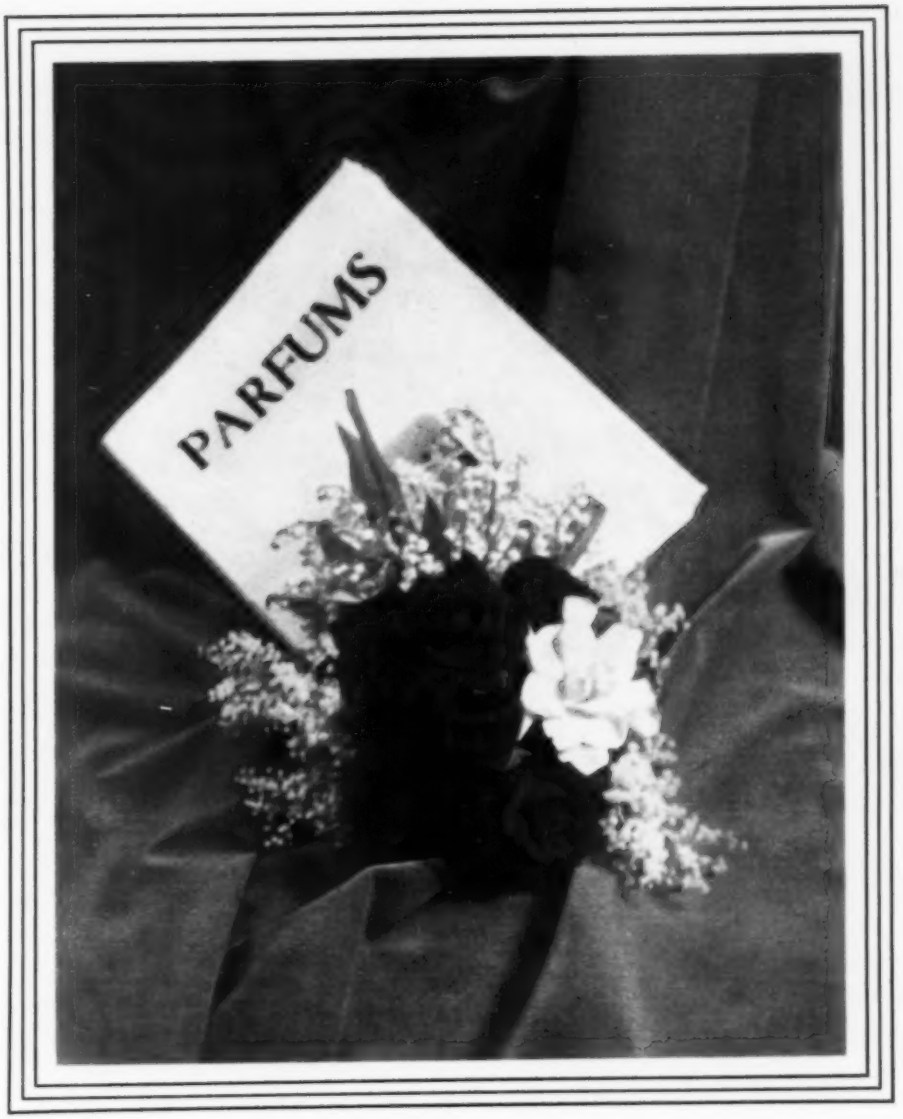

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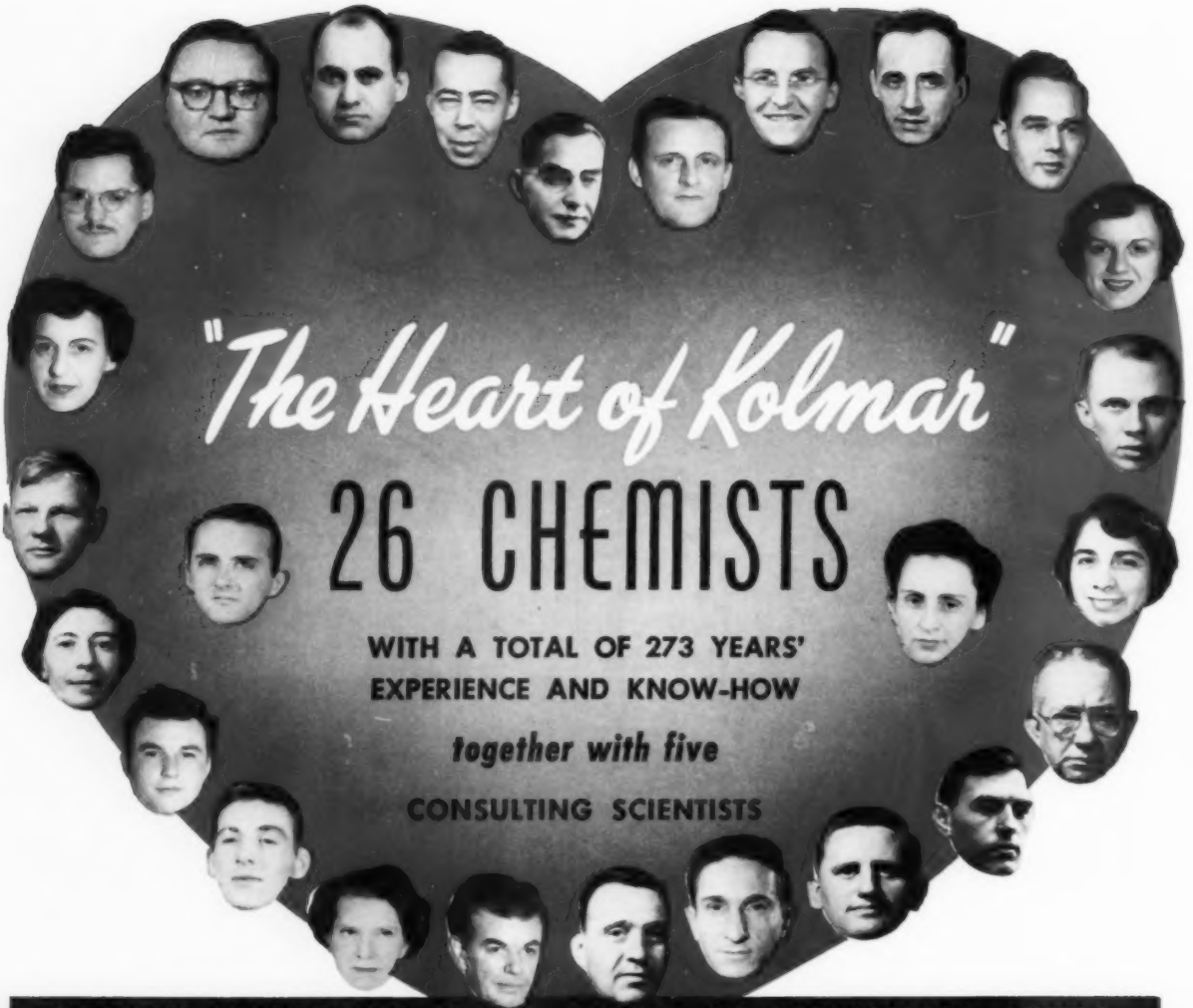
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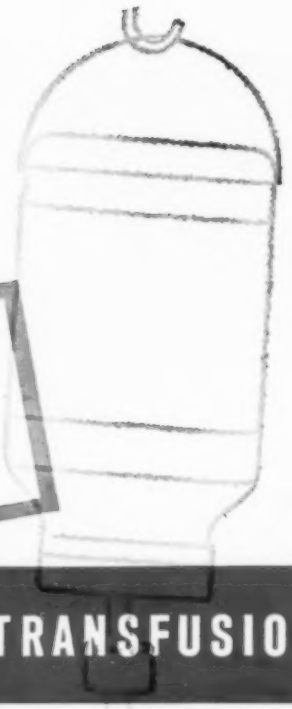

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High molecular weight polyethylene resins are reported to give excellent corrosion resistance when applied as coatings on metal surfaces.

Heat spraying equipment is available which reduces solid polyethylene to a low viscosity liquid before flame spraying so that coatings can be applied swiftly and uniformly at an average rate of 10 sq. ft. per minute. This method of application requires a target preheating temperature of 150-190°F, reportedly much lower than previous methods of application.

Resultant coatings meet strict U. S. Navy specifications for adhesion, porosity, corrosion, electrolysis, impact and thermal shock.

New AEC Sodium Handbook Now Available

The third edition of the *Liquid-Metals Handbook* was released on July 1 of this year by the Atomic Energy Commission and Department of the Navy. Designated as the *Sodium-NaK Supplement*, it is devoted entirely to liquid sodium and liquid sodium-potassium mixes (NaK). Subjects covered include: chemical and physical properties; heat transfer and chemical engineering; system design; components; safety and fire protection; and applications.

Also available: *Sodium Plumbing* by William B. Cottrell and Leland A. Mann—a review of unclassified research and technology involving sodium at Oak Ridge National Laboratories.

These books are highly recommended as supplements to U.S.I.'s own literature on handling of metallic sodium.

New Reforming Unit Assures Maximum U.S.I. Ammonia Production

At the U.S.I. ammonia plant — Tuscola, Illinois — a new Girdler reforming unit has just been completed as an alternate raw material source in the production of ammonia from natural gas. Until now the only raw material for U.S.I. ammonia manufacture has been hydrogen from the neighboring ethylene production facilities of subsidiary National Petro-Chemicals Corporation.

The new unit will supplement the available hydrogen when necessary to make it possible to operate the ammonia plant at full capacity at all times. This plant is rated at 50,000 tons per year.

Alkali Metals On Agenda At Spring ACS Meeting

A symposium on the "Handling and Uses of the Alkali Metals" is scheduled for the national spring meeting of the American Chemical Society in Dallas, April 9-13, 1956. Metallic sodium, potassium, lithium, etc. will come under discussion.

U. S. I. OPENS TWO NEW ALCOHOL DENATURING, DISTRIBUTION PLANTS

New Units At Newark, N. J. and Tuscola, Ill. Also Serve As Distribution Points For U.S.I. Solvents and Chemicals

Two new combination ethyl alcohol denaturing plants, bonded warehouses, and solvent distribution points have been added by U.S.I. during the past month. One is at Tuscola in central Illinois, the production point for U.S.I.'s synthetic alcohol; while the other at Newark, N. J., replaces a smaller denaturing operation a short distance away. These new plants, along with existing units at New Orleans, La., Anaheim, Cal., and Chicago, Ill. permit overnight and often same-day emergency deliveries to alcohol and solvent users throughout most of the country. Integrated facilities at all locations can supply pure alcohol, denatured alcohol, SOLOX® proprietary alcohol solvent as well as other chemical solvents, in straight deliveries or mixed shipments in compartment tank cars, tank trucks, box cars and trucks.

The Newark plant has a 10 million gallon per year rated capacity, and is designed to handle the large tank truck volume in metropolitan New York and Northeast U. S. areas.

The Tuscola unit, designed to serve the Midwest with a flexible 12 million gallon per year capacity, is in the existing U.S.I. plant area where sulfuric acid, ammonia and nitrogen fertilizer solutions are produced. It is located next to subsidiary National Petro-Chemicals' manufacturing facilities for synthetic alcohol, ether, ethyl chloride, polyethylene and other petrochemicals.

Because these plants handle all denatured alcohol formulations, physical layout of the plant insures that only the required denaturants are present in any batch. This is accomplished by providing a separate line for each denaturant, and the use of 12 denaturing tanks. Gravity flow system insures complete

MORE

U.S.I. Offers Premixes, Feed Formulation Help

To keep pace with increasing demand of feed manufacturers for premixes, U.S.I. has expanded the scope of its nutritional services.

Vitamin and antibiotic supplements are usually added to the ration in small amounts — a time-consuming operation demanding careful attention, where slight measurement errors can prove costly. As a result, more and more feed manufacturers are buying USIMIX Premixes which contain vitamins, antibiotics, methionine and other additives in batch-size packages mixed to their specifications.

Also available: U.S.I. formulation service, offered to feed manufacturers on a confidential basis. U.S.I. will review feed formulations and offer suggestions.

New U.S.I. alcohol denaturing and distribution plant at Newark, N. J.

Nov.-Dec. ★ **U.S.I. CHEMICAL NEWS** ★ 1955

CONTINUED

Alcohol Units

drainage of all tanks and discharge lines. But with all of these built-in safeguards, chemical analysis of each batch is the final test. Years of application in other U.S.I. denaturing plants have proved the effectiveness of these methods of control.

Both plants have been designed to meet the pace of the fast-moving alcohol industry. Push-button control of the denaturing operation from a central control room permits quick preparation of formulas. Paper work delays are avoided by teletype connections between each plant and the U.S.I. sales divisions, a system which insures the best possible service for U.S.I. alcohol and solvent customers whose requirements were the governing factor in the design of these plants.

Permits, Bonds No Longer Needed On Sodium Ethylate

Purchasers of U.S.I. alcoholic solutions of sodium ethylate (15-20%) no longer need to file permit form 1485, nor do they need bonds to cover such purchases. The product can be sold only to firms using it in chemical processes and such firms will be required to submit to A&TTD, for approval, Form 1479-A in quadruplicate, stating the process and recovery and reuse of the alcohol.

Sodium ethylate is made by reacting sodium metal with anhydrous ethyl alcohol. U.S.I. supplies finished product and both raw materials.

"U.S.I. Isosebacic" Acid First Project For New Cincinnati Pilot Plant

U.S.I. has just completed a new half-million-dollar pilot plant building at its research site in Cincinnati, Ohio. The new building provides 15,000 sq. ft. of versatile plant space, air-conditioned control laboratories, and the necessary utilities for final testing of processes and products developed by the U.S.I.-National Distillers Research Department.

The research program is aimed particularly at the development of new products and processes which integrate with other industrial chemicals produced by U.S.I. and subsidiary National Petro-Chemicals Corporation. First product to be piloted in the new research building is "U.S.I. Isosebacic" acid, which exemplifies this research goal in that it is derived from both sodium and petrochemical sources. Evaluation quantities of the new material will be turned out, and the process, originally piloted at another location, will be polished up. Samples are now freely available to all interested researchers.

Preliminary work indicates that polyurethan flex-foams will provide a major outlet for this new dibasic acid. When made from "U.S.I. Isosebacic" acid, these materials seem to have more uniform cellular structure and excellent elasticity.

In the vinyl resins field, evaluations of compounds plasticized with esters of "U.S.I. Isosebacic" acid show an unusually high resistance to extraction by soapy water and oil.

National Distillers research laboratories in Cincinnati, O. New pilot building at right rear.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

New alkaline agent for stripping anodic coatings from aluminum eliminates waste disposal problem metal finishers encounter with acids. Water solutions at room temperatures remove average coatings by immersion only, in seconds. **(No. 1120)**

Spiral polyethylene tower packings now available show 140% increase in efficiency over other types, reduce packed height needed for separations. Liquid is held in interstitial spaces rather than on wetted surfaces. **(No. 1121)**

Edible gum for thickening water is now offered which gives viscosity of 3000 cp at 1% concentration, provides colloidal stabilization. One cent worth per pint makes a barely pourable solution, tasteless and odorless. **(No. 1122)**

New folder describes Flexspout® polyethylene closures on 5-gallon drums of U.S.I. ethyl alcohol USP, and U.S.I.'s proprietary denatured alcohol solvent SOLOX®. Illustrates how spout can best be opened and used. **(No. 1123)**

New organic brominating agent with 54% minimum bromine content now in commercial production. Costs less than other types, is somewhat more stable, and more reactive due to higher solubility in many organics. Gives high yields. **(No. 1124)**

Entirely new type of adhesive can be permanent or temporary, depending on requirements. Used for labeling polyethylene and other plastics, it replaces pressure-sensitive labels, can be applied by brush or existing machines. **(No. 1125)**

Specimens of 25 starches and condiments, on microscope slides, now available as standards in examining foods — and for quality control, research, litigation and criminology purposes. Hair and fiber specimens also available. **(No. 1126)**

Newly developed paper admits air, but resists passage of oil, water and other liquids. Manufacturer working on use possibilities. One suggestion — paper raincoats to shed water but keep wearer cool on hot days. **(No. 1127)**

New patent on sodium for making sodium cyclopentadiene listed as one of group of Ziegler patents on metal-organics now purchasable in translation. Patent gives 10 examples of convenient manufacturing procedures in detail. **(No. 1128)**

A polyethylene sink trap has been designed for laboratory use. This plastic resists acids, alkalis, fluorides and other chemicals; is physically tough and flexible. No tools required for installation, removal or replacing. **(No. 1129)**

PRODUCTS OF U.S.I.

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Ethyl Alcohol (Ethanol)—Specially denatured—all regular and anhydrous formulas. Completely denatured—All regular formulas for industrial use, anti-freeze. Pure alcohol—USP 190°—Absolute, N.F., taxfree, taxpaid.

Butanol (Normal Butyl Alcohol)—Latent solvent for nitrocellulose, solvent for ethyl cellulose, many resins, many chemical syntheses.

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Fusel Oil, Refined—Blend of amyl alcohols refined by chemical treatment, distillation.

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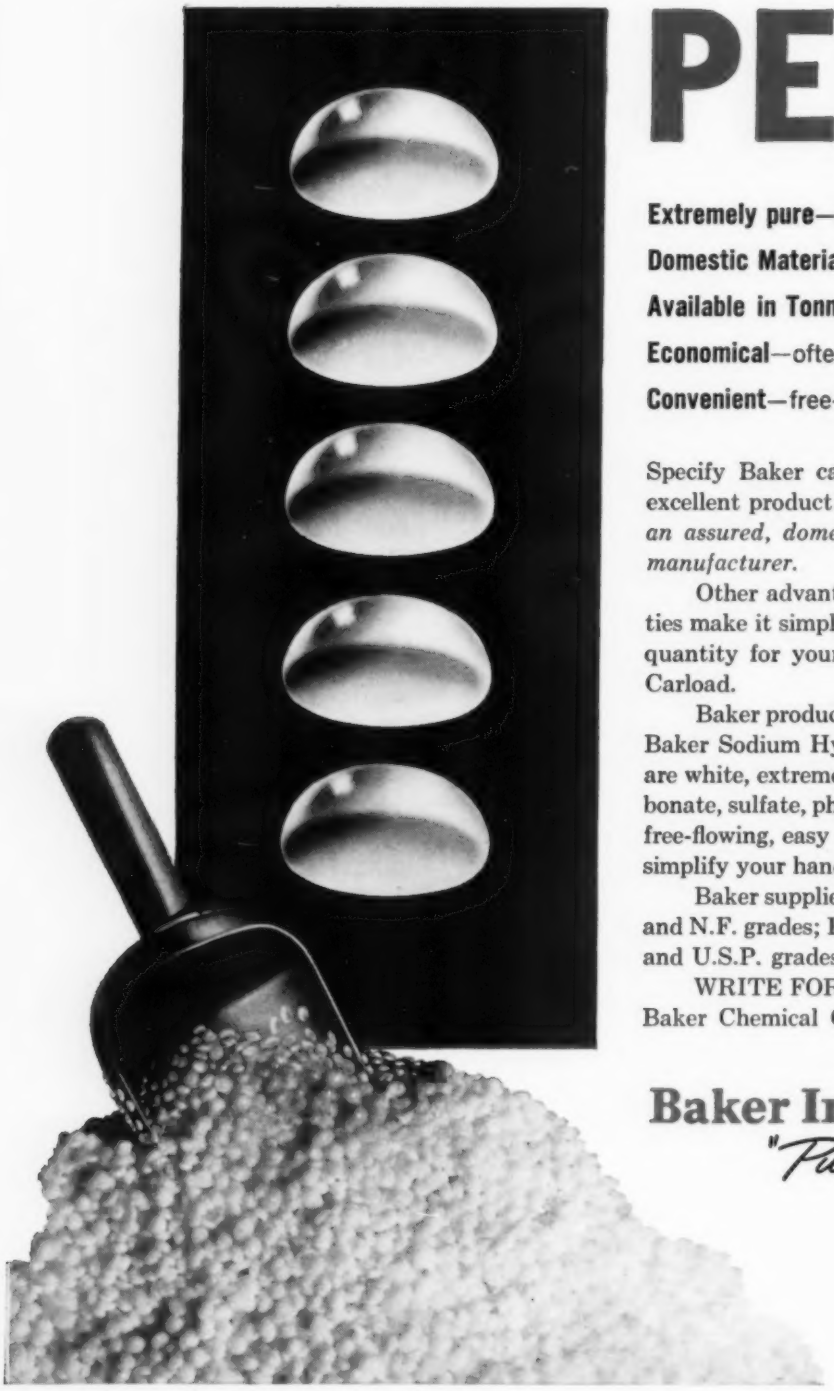

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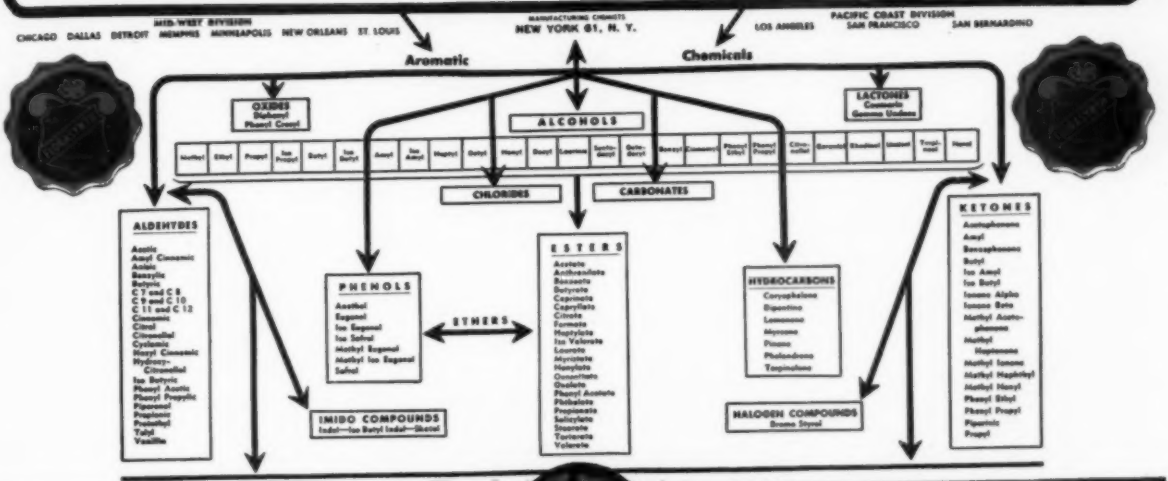

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PEDANIOS DIOSCORIDES (first century A.D.). Greek physician celebrated for his writing of "Materia Medica." His name was popularly associated, even through the Middle Ages, with sound medical botany. His works attributed most medicines as coming from plants. He is shown studying the Mandrake root.

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The real difference in fatty acids cannot be detected merely by observing the acid itself, or even by laboratory examination. They are evidenced only in processing in your plant and in the sales-appeal and keeping qualities of your product. On this basis, a comparison of available stearic and oleic acids will show that the controlled composition and outstanding stability of the Emersol® grades give you the *greatest value* through: 1) consistent manufacturing performance, 2) lighter-colored and higher quality products, 3) lower over-all costs, 4) consistent bland odor, both initially and after aging, for uniform perfuming, 5) longer shelf life, and 6) consistent performance in the hands of your customers.

Confirmation of these extra values lies in actual customer experiences, some of which are reproduced below. And since Emersol Stearic and Oleic Acids cost no more than competitive grades, why not order your next requirements from Emery and obtain such benefits yourself?

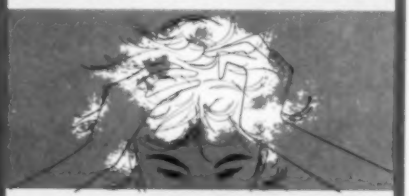
how Emersol 132 Lily improved consistency and texture of medicinal cream

Case History No. 13-51 . . . Attracted by lower prices, this manufacturer of medicinal creams switched from Emersol 132 to a high-quality hydrogenated solid acid. Immediately, the non-crystalline structure of the latter product reflected in an objectionable change in the texture and consistency of the cream . . . substantially reducing its performance and sales-appeal. The switch back to crystalline Emersol 132 Lily [illegible]

how Emersol 132 Lily gave lighter-colored esters for cosmetics and toiletries

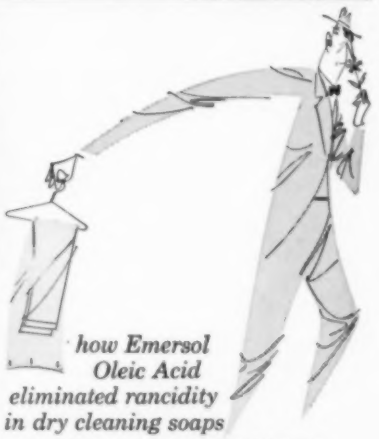
Case History No. 12-51 . . . Because of the higher purity associated with lighter-colored products, this well-known manufacturer of esters was approached for lighter-colored monostearates for use in cosmetics, toiletries, and similar type products. Since esters are exposed to high temperatures during manufacturing, this producer's logical approach was to investigate the color stability of his ingredients. On checking various stearic acids, he found that the outstanding color stability of Emersol 132 Lily gave him exceptionally light-colored monostearates, far better than those from all others tested. And since Emersol 132 costs no more than competitive triple-pressed grades, this extra "sales-appeal" cost him nothing.

Emersol® 211 Elaine increased sales appeal of premium shampoo



Case History No. 22-42: A well-known manufacturer of premium shampoos replaced the ordinary single-distilled oleic acid in his formulation with Emersol 211 Low Titer Elaine because of its uniform color and greater resistance to color change during aging. The resultant uniform color of his shampoos produced greater consumer acceptance and subsequently greater sales.

While uniformity of color was this manufacturer's primary concern, he found also that Emersol 211's outstanding oxidation stability, superior resistance to rancidity, uniform viscosity, and low unsaponifiable content, added materially to the overall quality and aging properties of his products. And since Emersol 211 costs no more than competitive grades, all these sales advantages were realized at no extra cost.



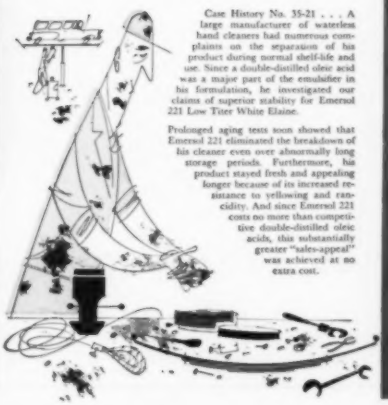
how Emersol Oleic Acid eliminated rancidity in dry cleaning soaps

Case History No. 25-50 . . . To reduce complaints of odor in cleaned clothes, this well-known manufacturer of dry-cleaning soaps evaluated the resistance to rancidity of all available high-quality oleic acids. His tests proved conclusively that Emersol 233 LL Elaine gave his product maximum resistance to rancidity . . . far better than any other oleic acid tested. In this case, not only were "odor" complaints reduced substantially, but an important sales advantage was gained over competitive dry cleaning soaps.

Emersol® 132 Lily withstood 2 years Storage with no ill-effects

Case History No. 2-51: A medium sized manufacturer of high-quality esters uncovered a number of bags of Emersol 132 Lily that somehow had escaped inventory rotation. Although the appearance and odor of the material was normal, he sent samples to us for assurance that it still met our high quality standards since his records indicated receipt 2 years ago. Our test results indicated that the Emersol 132 Lily was practically as good as the day it was made.

Emersol® 221 White Elaine eliminated breakdown of waterless hand cleaner



Case History No. 35-21 . . . A large manufacturer of waterless hand cleaners had numerous complaints on the separation of his product during normal shelf-life and use. Since a double-distilled oleic acid was a major part of the emulsifier in his formulation, he investigated our claims of superior stability for Emersol 221 Low Titer White Elaine.

Prolonged aging tests soon showed that Emersol 221 eliminated the breakdown of his cleaner even over abnormally long storage periods. Furthermore, his product stayed fresh and appealing longer because of its increased resistance to yellowing and rancidity. And since Emersol 221 costs no more than competitive double-distilled oleic acids, this substantially greater "sales-appeal" was achieved at no extra cost.

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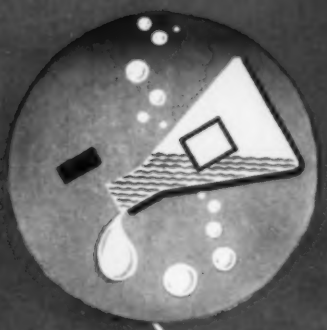

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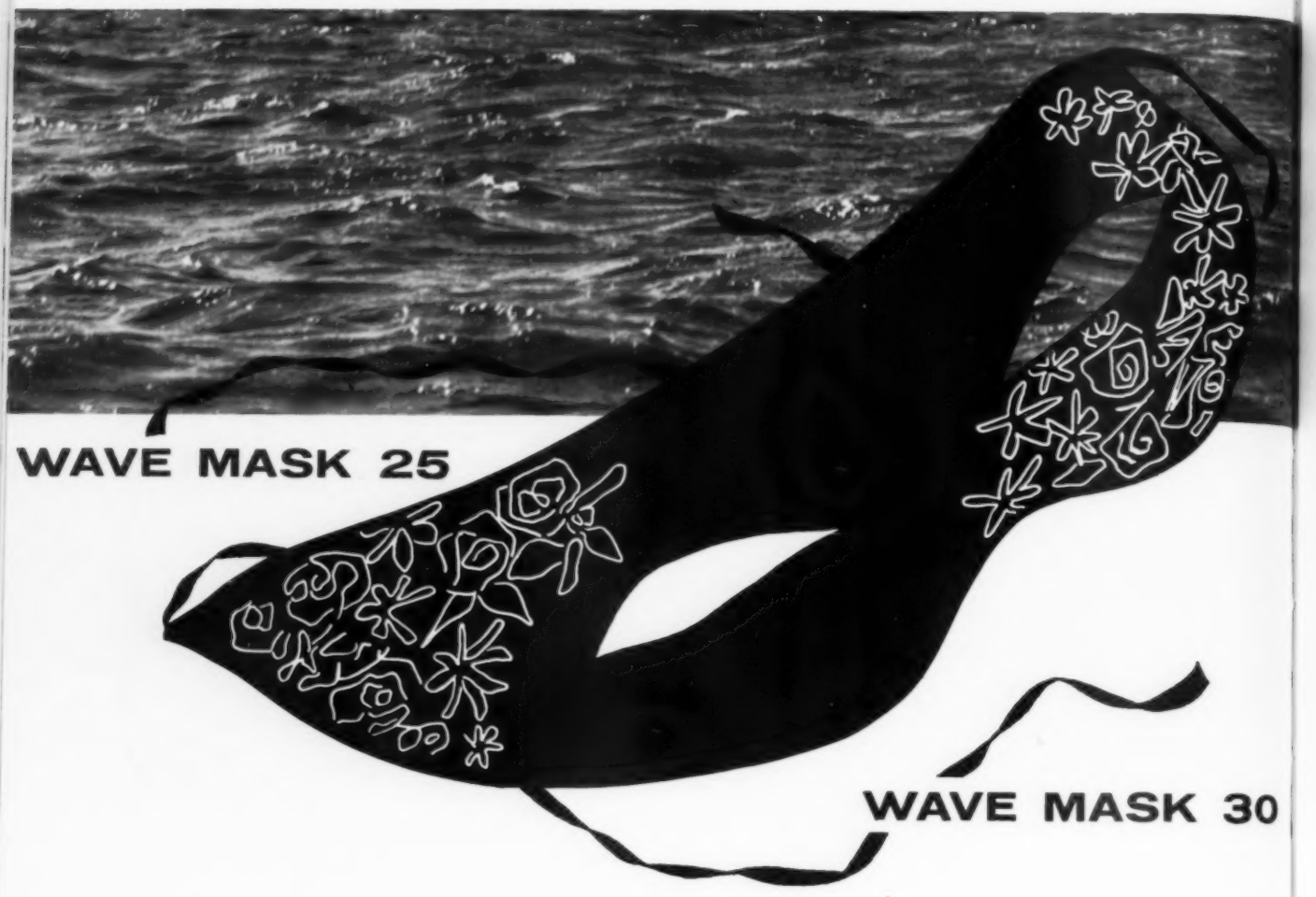

One of the greatest problems in the formulation of home permanents can now be met successfully with new Synfleur fragrances, WAVE MASK 25 and WAVE MASK 30.

Developed in the Synfleur laboratories after long and intensive research into the difficulties posed by the odor of these preparations, these new Synfleur fragrances have proven themselves ideal for the purpose. WAVE MASK 25 and WAVE MASK 30 were evolved by skilled Synfleur chemists and technicians as artistic formulations for cold wave preparations. They are based on essential oils and aromatic chemicals carefully screened for stability, compatibility and solubility.

These basic fragrances can also be adapted for effective, economical use in other thioglycolate products where similar masking problems are encountered. Our laboratories are at your disposal to assist in their incorporation. Simply ask for samples, data or other help – without obligation.

WAVE MASK 25
$3.00 the pound

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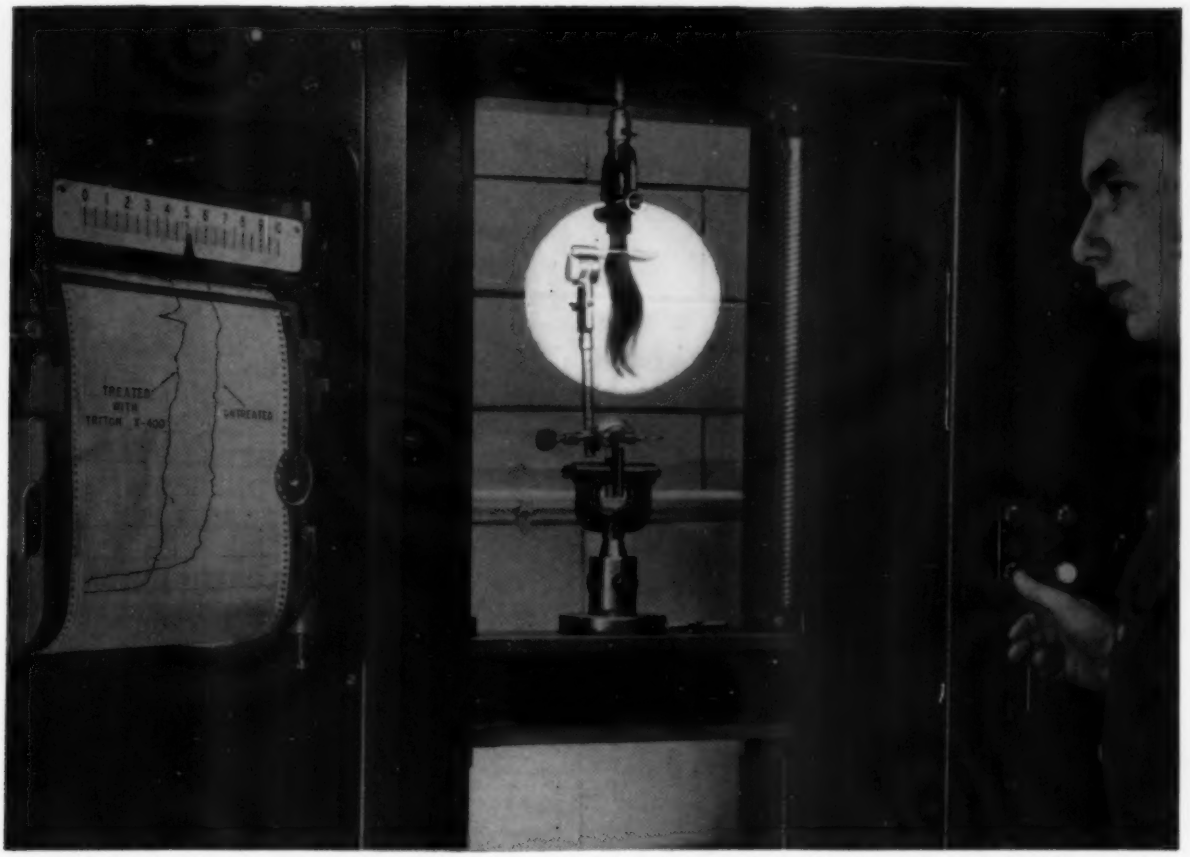

Instron Tensile tester proves that more force is required to pull a comb through washed, untreated hair than through hair washed and then treated with TRITON X-400 solution. The right-hand curve on the chart indicates load necessary to pull comb through clean, untreated hair. When the tress is washed and treated with TRITON X-400 solution the load is reduced to the level shown by the left-hand curve being recorded for the test in progress.

PROOF...TRITON X-400 makes hair easier to comb, softer, manageable

Comparative tests conducted in Rohm & Haas laboratories give positive evidence that cream hair rinses based on TRITON X-400 are superior in *many* respects. In fact, these tests show that hair treated with TRITON X-400 is measurably more manageable than untreated hair! For your customers this means:

Easier Combing...Softer...More Lustrous Hair

Not only does TRITON X-400 make hair easier to comb, but it also helps to keep hair in place. It makes hair substantially softer and more lustrous. It lubricates without being greasy.

TRITON X-400 is a paste based upon a cationic quaternary ammonium compound and a higher alcohol. It's relatively easy to formulate, and perfuming, coloring, and acidifying agents can be incorporated in the final mix.

Try TRITON X-400 in your cream rinse formulations now. See your Rohm & Haas representative or write direct for test samples.

TRITON is a trade-mark, Reg. U.S. Pat. Off. and in principal foreign countries.

CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

HEYDEN
BENZALDEHYDE

a versatile intermediate for dyes, pharmaceuticals, chemicals, essential oils... and YOUR NEW PRODUCT!

Some of the applications for Benzaldehyde, such as in flavors and odorants, depend on the physical properties of volatility, odor and taste. Other uses—for instance, in the synthesis of dyes and drugs—are based on its chemical reactivity.

Which of these properties—physical or chemical—are of interest in the development of your new product? Heyden, the leading manufacturer of Benzaldehyde, offers two grades designed for various uses. The unsurpassed purity of Heyden Benzaldehyde N.F. (F.F.C.) makes it the preferred product for the formulation of cosmetics, odorants and flavoring agents. For use in organic syntheses, Heyden Benzaldehyde Technical can be depended upon for high quality and uniformity.

The Heyden sales office nearest you will welcome the opportunity to discuss your requirements, or see that you receive samples and technical information.

OTHER HEYDEN INTERMEDIATES

o-Chlorobenzaldehyde
p-Chlorobenzaldehyde
o-Chlorobenzoic Acid
p-Chlorobenzoic Acid
2,4-Dichlorobenzoic Acid
3,4-Dichlorobenzoic Acid

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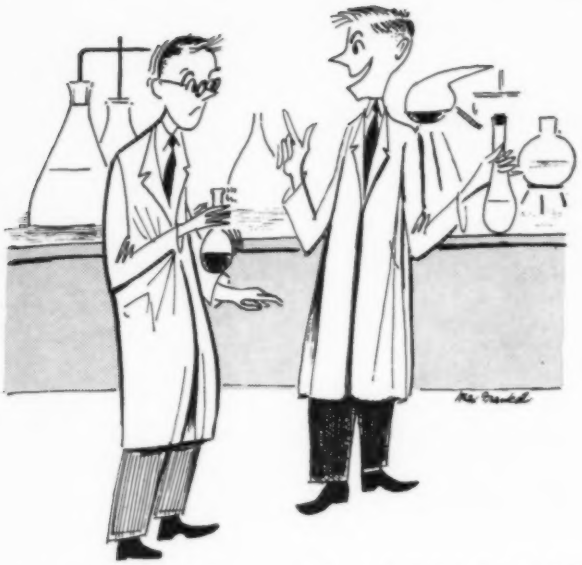


"I don't think the boss would mind if I took $64,000 from his competitor."

Keeping Posted

F.D.A. Keeps Colors for Cosmetics

The Food and Drug Administration issued its final order concerning the coal tar colors formerly listed as FD&C Orange No. 1, FD&C Orange No. 2, and FD&C Red No. 32. The final order forbids the use of these colors in foods, but leaves them available for use in externally applied drugs and cosmetics. These colors will henceforth be identified as EXT. D&C Orange No. 3, EXT. D&C Orange No. 4, and EXT. D&C Red No. 14.

Commissioner George T. Larrick said that the colors involved are harmless in the amounts ordinarily consumed in foods, but recent scientific investigation shows that they are not harmless when fed in large amounts. There never has been any evidence that these colors which are used to a minor degree in cosmetics and toiletries are harmful in such products, and accordingly their use is still permitted.

The FDA originally planned to decertify these colors completely and a proposed order covering these three colors was issued in December 1954. However, the Toilet Goods Association appeared at the original hearings on the matter and entered a vigorous protest along with evidence to the effect that the colors are harmless when used in cosmetics. The strong position taken by the Toilet Goods Association caused some of the leading pharmaceutical houses to protest complete decertification of these colors and to demand that they be left available for use in externally applied drug products. The final order may well be interpreted as a victory for the strong position taken by the Toilet Goods Association throughout the controversy.

Pharmaceuticals and Health

"During the past 24 hours, citizens just like yourselves suffered an average of 1,917 heart attacks, 5,260 cases of pneumonia, and 65,750 cases of grippe and influenza," Pierre A. de Tarnowsky, vice-president of marketing for Mead Johnson & Company, told the Industrial Council at Rennsselaer Polytechnic Institute. "The greater majority of these folks will survive these episodes of ill health but it takes different kinds of medicines in literally thousands of dosage forms to restore them to their normal status of well being and productivity," he added.

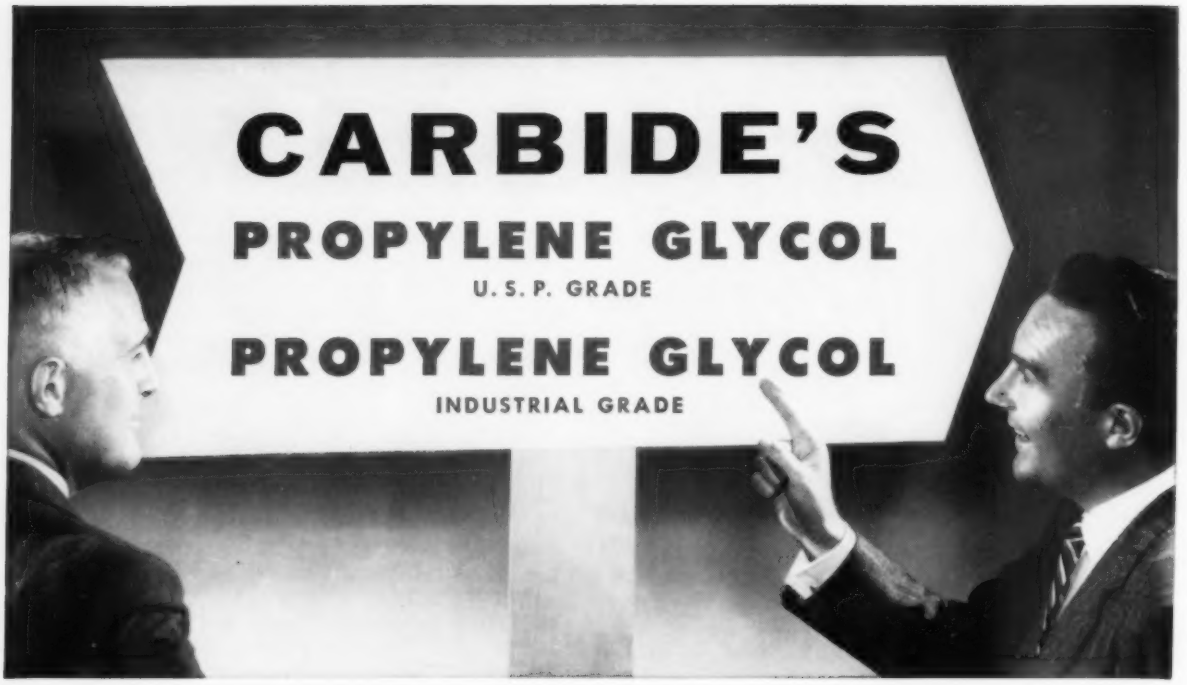
With respect to the large and increasing number of pharmaceutical specialties on the market, Mr. de Tarnowsky said:

"With what is often remarkable ingenuity, companies are constantly devising a cascade of either new pharmaceutical specialties or new refinements of already well-known products with which to tempt the doctor's prescription or specification away from a competitor. One of the first rules for a marketing team of any pharmaceutical organization is to be mentally and emotionally prepared for constant product obsolescence and displacement by a competitor at any time. In fact, the major pharmaceutical firms are so dedicated to raising standards and quality that they even go to the extent of working assiduously to make their own products obsolete.

"You are all familiar with the immense variety of products of a single type which are offered to you by all kinds of manufacturers. You ladies who shop regularly at supermarkets are well aware that you can select the brand of coffee you prefer from two dozen kinds; that you can select from a dozen kinds of soap powders or half a dozen kinds of pickles or salad dressings. You gentlemen can select any one of a dozen makes of tires or batteries for your automobile; suits or shoes for your wardrobe; rods and reels for your fishing equipment.

"The pharmaceutical industry offers your doctors the same degree of selectivity. He can select the kind of medication which will exactly meet the requirements of your specific illness from a vast array of dosage forms and formulations.

"The manufacturer of proprietary products is faced with an even more competitive situation. And this is one of the big investment headaches for your retail



You're looking in the right direction

Propylene glycol U.S.P.—a glycol with proven high purity—has the excellent properties demanded by industry for pharmaceuticals, dyes, food flavors, and certain perfumes. Propylene glycol also assists in the dispersion of soaps, oils, waxes, and greases in water.

When used in cosmetic and brushless shaving creams, for example, propylene glycol enhances the softening and cleansing action on the skin and is a mild humectant for the cream. In brushless shaving creams, it aids in coupling the oils and lanolin in water.

CARBIDE also produces an industrial grade of propylene glycol that is widely used as a component of polyester resins, a coupler in hydraulic brake fluids, and as a coolant in refrigeration systems.

Carbide and Carbon Chemicals Company, producer of propylene glycol since 1931, produces thirteen other diols and triols:

- *Ethylene glycol*
- *Diethylene glycol*
- *Triethylene glycol*
- *Dipropylene glycol*
- CARBOSEAL *Anti-leak*
- KROMFAX *Solvent* (*Thiodiglycol*)
- *2-Ethyl-2-Butyl Propanediol-1,3*
- *2,2-Diethyl Propanediol-1,3*
- *Hexylene Glycol*
- *3-Methyl Pentanediol-1,5*
- *Hexanetriol-1,2,6*
- *2-Ethylhexanediol-1,3*
- *Pentanediol-1,5*

For further information on propylene glycol or any CARBIDE chemical, write for your copy of "Physical Properties of Synthetic Organic Chemicals" (F-6136) or the "Glycols" booklet (F-4763). Offices in principal cities—in Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal and Toronto.

CARBIDE AND CARBON CHEMICALS

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The terms "Kromfax" and "Carboseal" are registered trade-marks of Union Carbide and Carbon Corporation.

pharmacist. You can select from 57 pain relievers for a headache, 247 hair care items, 144 cough and cold remedies, and 253 laxatives."

Patent on Tranquilizing Drug

The first tranquilizing drug discovered in this country, and the first drug believed to have been developed expressly for tranquilizing, is now covered by a patent. U. S. Patent No. 2,724,720 has been granted to Dr. Frank M. Berger and Dr. Bernard J. Ludwig, both of Wallace Laboratories, a division of Carter Products, Inc., covering meprobamate, ethically distributed by the originators under the trademark name of Miltown, and also ethically distributed under the trademark name Equanil by Wyeth Laboratories who are licensed by Carter. The patent is assigned to Carter. It is pointed out by the originators of the drug that previous tranquilizers, such as chlorpromazine and reserpine, were developed abroad, reserpine in Switzerland from a root used by ancient inhabitants of India, and chlorpromazine in France. Furthermore, reserpine was first used for high blood pressure, and chlorpromazine was synthesized in a search for antihistamines and was first used in the treatment of nausea and vomiting.

The Industrial Conference at Rensselaer

The executives of the pharmaceutical industry did a real job in presenting a true picture of their industry to the educators of the nation at the Industrial Council recently held for three days at Rensselaer Polytechnic Institute, Rensselaer, N. Y. Over 100 company presidents, vice-presidents, and other top executives of the leading firms in the pharmaceutical industry met with more than 650 secondary school teachers of social science representing every state in the Union for the purpose of developing a better understanding of the social and economic implications of the pharmaceutical business.

Surprising as it may seem, the executives from the pharmaceutical industry learned a great deal from the educators to whom they were presenting the facts of the industry. Robert A. Hardt, vice-president of Hoffmann-La Roche, program chairman for the Council, told the teachers at the concluding session: "I don't mind telling you that we have learned more from you than you have from us." Mr. Hardt went on to say that the industry executives had come to realize that their public relations efforts had been "primitive," particularly in respect to their failure to provide educational material for the schools. "You have made it possible for our industry to become aware of its shortcomings and its special responsibilities," he said.

Total attendance including industry officials, educators, editors, and observers from other industries, was well over 1,000. Major addresses were given by John A. MacCartney, manager of trade relations for Parke, Davis & Company; Dr. Theodore G. Klumpp, president of Winthrop laboratories; Dr. Ernest H. Volwiler, president of Abbott Laboratories; Dr. Raymond M. Rice, executive director of medical research, Eli Lilly and Company; and Pierre A. de Tarnowsky, vice-president for marketing, Mead Johnson & Company.

Dargavel Foundation Functioning

The John W. Dargavel Foundation, organized to aid retail druggists and to make loans to students in pharmacy, has commenced operations, according to Albert C. Fritz, president. The Foundation has thus far received contributions of $189,003 toward its initial capital goal of $250,000, according to Mr. Fritz. The first goal is now in sight, he said, and the Foundation's executive committee has approved operations on a full scale. Retailers have oversubscribed their quota of $100,000, with $97,758 already contributed and an additional $10,858 pledged. Contributions from wholesalers amount to $15,975, and from manufacturers, $64,412. Solicitation of the wholesaler and manufacturer segments of the drug industry will continue until their combined quota of $150,000 is attained. In addition, the National Association of Retail Druggists has increased its yearly membership dues from $10 to $12.50, with the net increase to be contributed to the Foundation. Also, Mr. Fritz announced a pledge of $100,000 to the Foundation, payable when the original $250,000 capital fund is realized. Mr. Fritz said that this pledge was from "a source I am not at liberty to divulge," but pointed out that this will bring the total available to the Foundation at that time to $350,000. The Foundation has raised its fund goal from the original $250,000 to $1,000,000, said Mr. Fritz. However, wholesalers and manufacturers will not be asked to contribute toward the additional $750,000 which will be sought solely from retail druggists.

Objectives of the Foundation are 1. to aid retail druggists to reestablish their businesses when disaster strikes; 2. to make loans to worthy students in pharmacy; 3. to make outright gifts to druggists in dire need. The Foundation has under consideration made several direct money grants to aid druggists whose businesses were seriously damaged by the August floods in several northeastern states. Loans have also been approved to enable five deserving students to enroll or to remain in colleges of pharmacy—an area in which a study has established that the Foundation's assistance will be increasingly sought.

Physically Disabled Exhibition

Physically disabled employees demonstrated their work as operators of a collapsible tube-filling machine in an exhibit of G. Barr and Co., Chicago chemical and cosmetic manufacturer, at a national exposition of employment of physically handicapped workers held in Chicago late last month. The Barr employees manning the exhibit included a deaf mute, a blind man, and a polio victim. The company employs approximately 200 employees of whom two-thirds are handicapped. Founder of the company in 1935, and serving as president and treasurer of the company, George Barr, who is himself physically handicapped, is Illinois chairman of the Governor's Committee for

LATEST EDITION

Laboratory Data Sheet

VITAMIN A 'ROCHE'

Liquid vitamin A palmitate and acetate
Dry vitamin A acetate
Dry vitamin A and D_2

VITAMIN A

Roche has all popular types for your manufacturing needs

Summarized below for your convenience are facts about the many types of Roche vitamin A and vitamin A & D combinations which meet practically all pharmaceutical needs. Samples and technical literature are yours on request — without charge, of course. Ask your Roche salesman or write.

	Type & Name	Usage	Potency (in U.S.P. units per gram)	Additive	Stability	Mesh Size
LIQUID TYPES	**P1MO** Vitamin A palmitate *(liquid)*	In tablets, aqueous dispersions, capsulated products	1,000,000	Edible oil only, for standardization	Excellent	–
	P1MO/BHA Vitamin A palmitate *(liquid)*	as above	1,000,000	Edible oil plus antioxidant (butylated hydroxy-anisole). Note 1.	Excellent	–
	P1.3 Vitamin A palmitate *(liquid)*	For oil-free prepara-tions	1,350,000 to 1,450,000	None	Excellent	–
	A1MO Vitamin A acetate *(liquid)*	In oil solutions and gelatin capsules	1,000,000	Edible oil only, for standardization	Excellent	–
SPECIAL	Type P1.8 *(liquid)* Vitamin A palmitate	For research and special production	1,650,000 to 1,800,000	None	Needs special handling	–
	Type A2.9 *(crystalline)* Vitamin A acetate		2,800,000 to 2,900,000	None	Needs special handling	–
DRY TYPES	Type 325A-32.5D Vitamin A acetate & Vitamin D_2 *(dry)*	For tablets, capsules, vitamin-fortified powdered supplements	A—325,000 D_2—32,500	None	Excellent	40 and 60
	Type 325 Vitamin A *(dry)*		325,000	None	Excellent	40 and 60
	Type 500 *(dry)* Vitamin A acetate	For dry prepara-tions: tablets, capsules, vitamin-fortified powdered supplements	500,000	None	Excellent	40 and 60
	Type 500A-50D Vitamin A acetate & Vitamin D_2 *(dry)*		A—500,000 D_2—50,000	None	Excellent	40 and 60

Note 1 { Antioxidant added at 10 mg. per 1,000,000 units of vitamin A.

Packaging { All Roche vitamin A is packaged to insure safety in transit and ease of handling in pharmaceutical operations.

Vitamin Division

HOFFMANN-LA ROCHE INC.

Nutley 10, New Jersey NUtley 2-5000

Pacific Coast distributor: **L. H. BUTCHER COMPANY** • San Francisco • Los Angeles • Seattle • Portland Salt Lake City • *In Canada:* Hoffmann-La Roche Ltd., 286 St. Paul Street, West; Montreal, Quebec

Reprints of these data in 8¾" x 11" size are available on request. These can be used in the new Roche loose-leaf catalog, or in any standard 3-ring binder.

the Employment of the Physically Handicapped. In 1951 he personally accepted a citation from President Harry S. Truman commemorating his outstanding efforts in employing the handicapped. The Barr Company was one of approximately 75 exhibitors at the exposition.

Plea for College Support

In this issue S. B. Penick & Company and The New York Quinine & Chemical Works are using an additional page of advertising to broadcast a message which has nothing to do with the products which they offer for sale. Rather is the message solely concerned with an appeal to individuals and corporations to ponder upon and act upon the financial situation of our colleges and universities.

F.T.C. Acts on Cosmetic Rules

To many in this industry it has appeared that once the Federal Trade Commission promulgated its Trade Practice Rules for the Cosmetic and Toilet Goods Industry on November 29, 1951, and later amended these rules on September 10, 1954, it was paying practically no attention to the industry, or else every manufacturer and distributor in the industry was strictly obeying these rules.

However, almost four years after the original rules were promulgated, or on November 14, 1955, the Commission has issued complaints against four cosmetic manufacturers, and states that "the complaints resulted from an investigation made to determine whether companies were complying with the Trade Practice Rules for the Cosmetic and Toilet Goods Industry." Also the Commission states that "similar complaints against other major cosmetic firms are being considered."

The complaints, which charge the companies with unfair discrimination among customers in the granting of promotional aid, were issued against Elmo, Inc., Hudnut Sales Company, Helena Rubinstein, and Yardley of London. The complaints charge that advertising allowances, cooperative advertising materials, payments for demonstrator salesmen and the like were not made available on "proportionally equal terms" to all competing customers. Elmo is charged, for example, with paying eight competing customers in the Chicago area promotional allowances at different rates ranging up to 25 per cent of their purchases while others received no allowances.

Helena Rubinstein is charged, among other things, with giving two large department stores in Washington, D. C., a higher percentage of their purchases as a promotional allowance than competitors who actually furnished the same of greater service.

In the Chicago area, according to the Commission, Hudnut Sales paid eight favored retailers from 87 to 100 per cent of their expenses for advertising Hudnut products in the newspapers while competitors received nothing.

Yardley of London is charged with paying customers handling only one Yardley line an allowance of six per cent of their purchases while competitors who handled two lines received 16 per cent. This difference, according to the complaint, is mainly due to that portion of a demonstrator salary paid by Yardley to the two line customers.

While the firms were granted thirty days in which to file answers to the complaints, hearings were scheduled before an FTC hearing examiner as follows: Elmo, Inc., January 26, Philadelphia; Hudnut Sales Company, January 23, New York; Helena Rubinstein, January 24, New York; and Yardley of London, January 25, New York.

More Tetracycline Patents

Chas. Pfizer & Co. have recently been granted eight patents on tetracycline in foreign countries. Two of the patents were granted in Brazil, one covering the production of tetracycline by direct fermentation, and the other covering production by catalytic hydrogenation of chlortetracycline. Additional patents on the production of tetracycline by direct fermentation were granted in Columbia, Turkey, and Union of South Africa. Other patents on production of tetracycline were granted in Germany, Peru, and Taiwan. Other foreign countries in which patents had previously been granted include Argentina, Belgium, Canada, Cuba, India, and Spain.

Cross-Licensing on Steroids

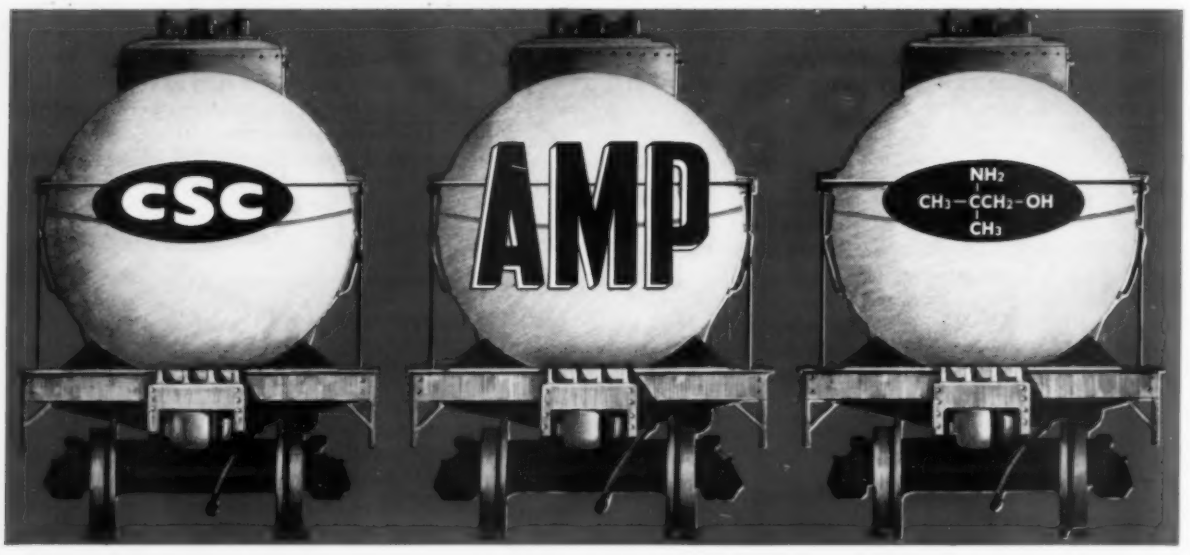
Merck & Co. and Schering Corporation announced last month the conclusion of patent cross-licensing agreements covering the manufacture and sale of prednisone and prednisolone, the two steroids for treatment of rheumatoid arthritis and other chronic diseases. The announcement came on the first anniversary of the initial clinical reports of these discoveries which were made public by Dr. J. J. Bunim of the National Institutes of Health in Bethesda, Maryland, on November 4, 1954.

Ethical Drug Future

Ten years from now the ethical pharmaceutical market in the United States should total around $1,650,000,000 at manufacturers levels annually, representing an increase of more than $650,000,000 above the present market, according to the prediction made by Eugene N. Beesley, president of Eli Lilly and Company before last month's annual meeting of the National Wholesale Druggists Association. The figure, which Mr. Beesley said "may be low," is based on an anticipated 27 million increase in population in the next decade, and on the prediction of economists that total disposable income will rise $113 billion in the same period to a total of $300 billion.

Although medical research in the last fifteen years has brought new and life-saving drugs and medicinal preparations, Mr. Beesley said, the American people are now spending one-fourth less of their total disposable income for medication than they did in 1939. The 1954 figure was 0.64 per cent of disposable income as compared to 0.87 per cent in 1939.

MORE AND MORE, INDUSTRY CALLS FOR



2-AMINO-2-METHYL-1-PROPANOL

as a highly effective emulsifier and chemical intermediate

AMP — another of the versatile CSC Nitroparaffin derivatives, is considerably more efficient than many commonly used emulsifying agents. Less AMP is required to give equal emulsion performance.

AMP oleate is a powerful emulsifying agent for water-wax emulsions. Its effectiveness in lower concentrations than are required for comparable results with other widely used amine soaps makes AMP oleate an economical and desirable emulsifying agent. At relatively low concentrations of AMP oleate, the water-wax emulsions are stable and unchanged after repeated freeze-thaw cycles and heat stability tests. High gloss and excellent leveling are characteristic properties of AMP oleate floor wax emulsions when proper concentrations of AMP and oleic acid are used.

The higher fatty acid soaps of AMP are powerful emulsifying agents for use in such materials as cleaners, polishes, dressings, self-polishing floor waxes and emulsion-type paints. AMP's moderately high boiling point minimizes evaporation loss and objectionable fumes during manufacture of emulsions — without detracting from desirable water resistance and durability of film. With its advantage of low combining weight and its ability to emulsify a wide range of materials, AMP may solve your emulsifying problem.

AS A CHEMICAL INTERMEDIATE

Readily undergoes a wide variety of reactions. AMP forms substituted amides with esters, anhydrides and acyl halides. Also reacts with many other compounds including alkyl halides, aldehydes, ketones, and carbon disulfide. AMP can be used in the synthesis of efficient surface-active agents and detergents, and vulcanization accelerators for rubber.

Also suggested for synthesis of dyestuffs, photographic developers, and pharmaceuticals. Investigate the many ways in which AMP can help improve your products or processes.

PHYSICAL PROPERTIES	
Molecular Weight	89.14
Boiling Point, °C	165 760mm
Melting Point, °C	30-31
Specific Gravity at 20/20°C	0.934
pH of 0.1M Aqueous Solution at 20°C	11.3
Solubility in Water at 20°C, g/100 ml	Completely Miscible

SPECIFICATIONS	
Neutral Equiv.	88.5-91.0
Color, APHA, max.	20
Water, by wt., max.	0.8%
Distill. Range	156°C - 177°C
Below 161°C max.	10%
Below 168°C max.	5%
Odor	Characteristic
Non-volatile matter by weight, max.	0.005%

OTHER AMINOHYDROXY COMPOUNDS

AB (2-Amino-1-butanol) $CH_3CH_2CHNH_2CH_2OH$

AMPD (2-Amino-2-methyl-1, 3-propanediol) $CH_2OHC(CH_3)NH_2CH_2OH$

AEPD (2-Amino-2-ethyl-1, 3-propanediol) $CH_2OHC(C_2H_5)NH_2CH_2OH$

TRIS AMINO (Tris[hydroxymethyl] aminomethane) $(CH_2OH)_3CNH_2$

Write for samples and Technical Data Sheet No. 18.

COMMERCIAL SOLVENTS CORPORATION

260 MADISON AVENUE NEW YORK 16, N. Y.

CSC INDUSTRIAL CHEMICALS

New Drugs and Doctors

The constant flood of new drug preparations and the claims made for them by manufacturers has raised the suspicions of the average doctor, Dr. Austin Smith, editor of the Journal of the American Medical Association, told the Parenteral Drug Association last month.

"There was a time when the drugs offered to the doctors were not particularly difficult to understand and use," said Dr. Smith. "There came a time, however, when things changed and the doctor was left hanging on the ropes from the barrage of drugs and claims made for them. For a while he resigned himself to trying to learn what he could. Then the situation became almost hopeless and he commenced to wonder if all this change is necessary, if it is good, and if it is believable. At this point he is more and more inclined to assume the role of a doubting Thomas. He hopes for the best but he is somewhat suspicious of what he sees and hears."

Dr. Austin set forth his ten commandments for the drug manufacturer:

1. Thou shall have no other goal but the creation of the best possible product.
2. Thou shall not be satisfied with cheap imitation.
3. Thou shall not take the name of scientific advisors in vain.
4. Remember the days of research to keep them respected.
5. Honour thy prescriber and patient as well as thy stockholder.
6. Thou shall not through carelessness cause injury or death.
7. Thou shall not commit adulteration.
8. Thou shall not steal profits and publicity by omitting important investigations.
9. Thou shall not give false testimony in defense of thy product or against thy neighbor's product.
10. Thou shall not covet thy neighbor's product but shall attempt to do better.

Rejected Antibiotic Found Meritorious

That rejection of an antibiotic because of its effect upon animals alone might not be justified is the contention of Drs. Michael G. Mullinos, Ruth Strang, Linn J. Boyd, Morton Schwimmer, Lois Lillick, and Israel G. Epstein of New York Medical College-Flower and Fifth Avenue Hospitals. This group found that the antibiotic, cycloserine, gave a much better account of itself in the treating of human tuberculosis and other infectious diseases than was indicated by screening tests. In fact, the drug had been rejected because of unfavorable results with animals.

In screening it has been common practice to put a new drug in a culture tube or dish with the bacteria to be killed. If the germs are killed or if the rate of their propagation is checked a test is then made on infected animals. If the drug has no marked effect upon animals, the drug is abandoned. If it has a marked effect upon animals it is passed on to the clinician for use in a hospital on humans. Because cycloserine did not have any marked effect on animals, it was rejected. However, the Flower-Fifth Avenue Hospitals decided to try it on humans anyway. During 17 months some 750 cases of various respiratory and other infections including tuberculosis were treated with cycloserine which proved to have great merit.

Now the question arises, how many drugs are there which failed to pass the animal test and were rejected might prove efficacious if tried on humans? Doubtless, a number of these will be looked into again. It seems that the animal testing of the future will be limited to determination of the drug's toxicity and will not be used as a measure of the drug's efficacy.

Revlon Selling Stock

Revlon, Inc. has filed a registration statement with the Securities and Exchange Commission covering a public offering of 373,900 shares of common stock of the corporation, of which 272,067 would be issued to raise expansion funds, and 101,833 would be outstanding stock to be sold for the account of certain stockholders. Revlon will use funds raised by the sale of the new stock to help finance the purchase of a factory at Metuchen, N. J. from Johnson & Johnson. The company plans to unite its Bronx and Brooklyn operations as a result of the acquisition.

A banking syndicate headed by Reynolds & Co. has been designated to make public offering of the 272,067 new shares, and 67,933 of the shares being sold by stockholders. The remaining 33,900 shares are to be offered by the selling stockholders directly to certain employees. Allowing for the new common shares, Revlon will be capitalized with 473,900 common shares and 860,000 shares of Class B stock. The company and its subsidiaries have no long-term debt.

Operating profits revealed for the first time in the registration statement give consolidated net income at $1,383,000 for the year 1954, and at $1,375,609 for the first eight months of 1955. Sales for 1954 are given as $33,723,000, up from $18,991,000 in 1950, and at $26,415,938 in the first eight months of 1955.

Asks for Cosmetic Information Pool

Dr. Kenneth L. Russell, president of the Society of Cosmetic Chemists, and a Director of Research at Colgate-Palmolive Company, recently addressed the New York and Chicago Chapters of the Society on the long-range importance of an exchange of ideas among scientists within the cosmetic industry. His plea is that chemists pool their information on methods of exploration and evaluation in cosmetic research.

"All research, whether directed toward cosmetics or toward other products or phenomena, generally consists of merely exploration and evaluation," Dr. Russell said, adding that the question of technique is one of the most troublesome problems facing cosmetic chemists. As a tie-in to his suggestion that a free interchange of research information would benefit chemists and industry alike, Dr. Russell announced the formation by the Society of Cosmetic Chemists of a Committee on Test Methods.

Headed by Dr. Donald H. Powers, of Warner-Lambert Pharmaceutical Company, and a past president

of the Society, the committee will serve as an assembly point from which research techniques and methods solicited from members and non members will be referred to outside laboratories for trial and criticism. The committee will use the reports of the trials as a basis for deciding which methods merit the sanction of the Society. Techniques that are approved will be designated as official Society of Cosmetic Chemists' methods.

Miles Issuing More Stock

Miles Laboratories has filed a registration statement with the Securities and Exchange Commission for 106,962 shares of its $2 par common stock. This stock is to be offered for subscription to stockholders at the rate of one new share for each ten shares held. The net proceeds will be added to the general funds of the company and will help pay for a new $1,000,000 expansion program in manufacturing and warehousing facilities in Elkhart, Ind. Earnings of the company are revealed for the first time at $1,875,455 for the first nine months of 1955, on sales of $31,282,457 for the period. Outstanding shares are 1,069,615.

NWDA Fills Greenbrier

One thousand and sixty members and their wives attended the 81st annual meeting of the National Wholesale Druggists Association held at the Greenbrier, White Sulphur Springs, W. Va., last month. Of this number 370 were active members, and 690 were associate members and invited guests. This attendance marked the largest number of people that the Greenbrier has ever had at one time in its history. However, even though every facility of the Greenbrier was taxed to capacity, the results were so satisfactory that the Association's Board of Control voted to return there next year on November 16 to 20.

Soaps and Detergents Set Record

Tonnage sales of soaps and detergents for the third quarter, reported by 78 companies participating in the quarterly census of the Association of American Soap & Glycerine Producers, and representing a very substantial portion of the entire industry's volume, totaled 1,047,032,000 pounds, valued at $247,904,000. This is an increase of 20 per cent tonnage-wise over the preceding quarter and 10 per cent over the third quarter of 1954. Furthermore, the tonnage sales for the third quarter were the highest for any quarter since 1951. Dollar sales for the third quarter were 22 per cent over the preceding quarter, and 13 per cent above the third quarter of 1954. The first nine months tonnage sales amounted to 2,804,005,000 pounds, which was four per cent over the first nine months of 1954. Dollar sales for the first nine months totaled $656,650,000, which was eight per cent over the total for the first nine months of 1954.

Tonnage sales of synthetic detergents, solid and liquid, for the first nine months totaled 1,746,831,000, which was 11 per cent over the first nine months of 1954. Dollar sales totaled $407,224,000, up 12 per cent over 1954. Sales of soaps, solid and liquid, totaled 1,057,174,000 pounds, compared with 1,119,003,000 pounds last year, a decline of five per cent. The dollar value was up 1.6 per cent to $249,426,000.

Wholesale Sales Manager's Activities

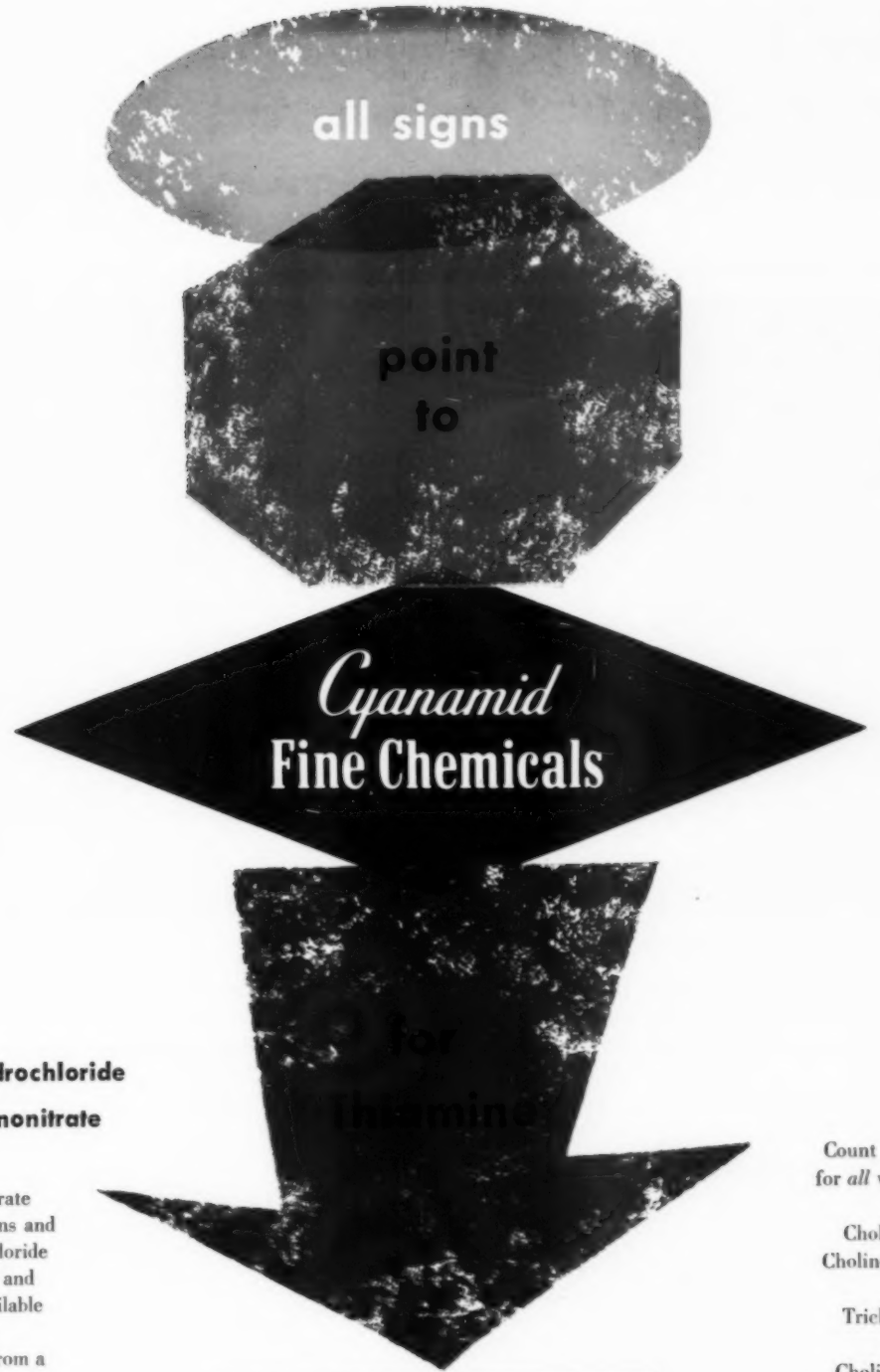
How the Wholesale Drug Sales Manager Spends His Time was told to the NWDA meeting by Wharton School Instructor James M. Alexander and NWDA Sales Management Committee member Robert H. Gilliam. An average wholesale drug sales manager spends nine hours and three minutes in his office each day of which 63 minutes is consumed in lunch period. Twenty-four per cent of his office day is spent in various conferences and meetings, and another 16 per cent in developing and analyzing sales information and sales reports. He has little time to spare and is actually unoccupied less than 0.5 per cent of his office day. He talks an average of 42 minutes per day on the telephone, of which one-quarter is spent talking to customers, and 22 per cent talking to salesmen. He spends about 45 minutes answering correspondence.

Nobel Prize and P. D.

According to Parke, Davis & Company, the scientific research which won the 1955 Nobel prize in chemistry for Dr. Vincent du Vigneaud, Cornell Medical College, carried a step further the development of two medicines first isolated in 1927 by a group of scientists under Dr. Oliver Kamm, retired director of research for Parke, Davis. Dr. du Vigneaud received his honor for learning the chemical makeup and later synthesizing two substances—exytocin and vasopressin—both present in the posterior lobe of the pituitary gland. For the separation of the two products, Pitocin (exytocin) and Pitressin (vasopressin) in the Parke Davis laboratories in 1927, the American Association for the Advancement of Science honored Dr. Kamm in 1929 for this "contribution to science." Pitocin is used to induce labor in childbirth, while Pitressin is indicated for controlling the body's water balance and to increase blood pressure.

Lemmermeyer Art Exhibit

An exhibit of forty oil paintings, portraits, and watercolors executed by Michael Lemmermeyer, president of Aromatic Products, Inc., New York, was a feature of the 42nd annual meeting of the Chemical Specialties Manufacturers Association held early this month in New York. A native of New York City, Mr. Lemmermeyer received his early art training at Cooper Union, continued his studies in both the United States and France while serving as an artist with the U. S. Army during World War I, and later was a student of Edmund Oppenheim, New York portrait painter. Although his recent work has been devoted exclusively to oils, watercolors, and pastels, much of his earlier pen and ink drawings are well known among World War I veterans whose regimental histories and camp publications featured his work.



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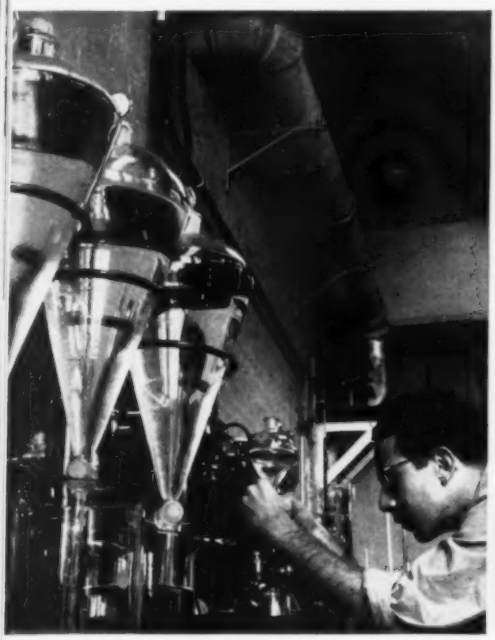

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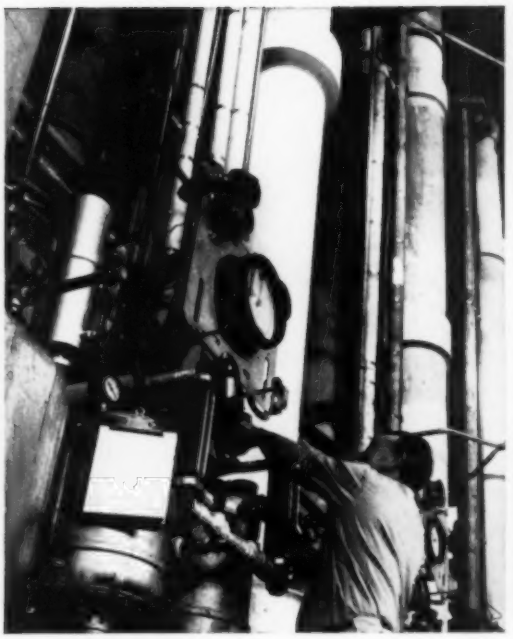

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DENTAL DECAY
Patent Developments

by Thomas Cifelli, Jr., PATENT ATTORNEY

RICHARDS AND CIFELLI
NEWARK, NEW JERSEY

The dentifrice field has been relatively quiet recently. For some time it was good for newsworthy developments almost on the average of one a year. In this connection will be recalled the developments of the ammoniated dentifrices, the use of chlorophyll, and, most recently, the use of sarcosides in dentifrices.

Two recent developments show that the dentifrice field still is receiving important attention. One involves patent litigation on the University of Illinois-held patents dealing with the ammoniated dentifrices and the other involves the recent issuance of a patent to Lever Brothers in this field.

Let us take a closer look at both of these developments.

U. of Ill. Patents Upheld

A U. S. District Court judge has upheld the Kesel and Wach patents, U. S. 2,622,058 and 2.542,886, in a suit involving the U. of Ill. Foundation, owners of the patents, and Amm-i-dent, Inc. and Block Drug Company. Judging from the published decision, the case must have been rather hotly contested. This indicates that an appeal will be taken to a higher court. Furthermore, it must always be remembered that there exists the possibility that other suits can be brought in other federal jurisdictions, where the results may be different.

In spite of the limiting factors just mentioned, a study of this case should be of advantage not only to those in the dentifrice field but to anyone interested in patents.

The Patents in Suit

The Kesel patent broadly covers the use of dibasic ammonium phosphate in dentifrices. Claim 1 reads as follows:

> A dentifrice comprising a non-toxic carrier adapted for oral administration and dibasic ammonium phosphate in proportion to provide under conditions of use in the mouth a concentration in the saliva sufficient to inhibit lactobacilli and being not substantially less than two per cent of the composition, and a flavor masking ingredient.

The Wach patent covers the use of urea in combination with dibasic ammonium phosphate, claim reading as follows:

> A dentifrice comprising a major portion of a non-toxic, non-sugary carrier adapted for oral administration, containing from one to 10 parts by weight of urea and from one to seven parts by weight of a dibasic ammonium phosphate, there being at least one per cent by weight of urea and at least one per cent by weight of the phosphate present in said dentifrice.

A third patent was also involved in the suit although no legal determinations were made with regard thereto. This third patent was one issued to Dr. Henschel, U. S. 2,542,518, this patent being licensed to Amm-i-dent, Inc. Claims 1 and 3 of the Henschel patent read as follows:

> 1. A powdered dentifrice including the following ingredients in substantially the following proportions by weight:

	Parts
Urea	15 to 50
Di-ammonium hydrogen phosphate	7 to 4
Abrasive	71 to 34

> 3. A dentifrice having as active ingredients, urea and diammonium hydrogen phosphate, the urea being by weight between 15 and 50 per cent by weight of the dentifrice and the diammonium hydrogen phosphate being four and seven per cent by weight of the dentifrice.

Work of Drs. Kesel and Wach

In the words of the judge:

The cause of dental caries (dental decay) has been studied for a good many years. It has generally been an accepted theory that a bacterium, called lactobacillus acidophilus, is found in the saliva and is associated with decayed teeth. Dr. Robert Kesel began a study of the individuals whose teeth were decay resistant and those who were not. He graduated from the College of Dentistry of the University of Illinois in 1926, with a degree of D.D.S. and from the University of Illinois Medical School in 1931, receiving an M.S. in Bacteriology. Since 1936 he has been head of the Department of Applied Materia Medica and Therapeutics of the College of Dentistry of the University of Illinois. From this study it was determined that there was an amount of ammonia in the saliva of caries inactive individuals which had the ability to inhibit lactobacilli, and that the amount was greater than normally produced by the breaking down of urea in the saliva. This indicated there was some source of ammonia in the mouth in addition to the salivary urea. Dr. Kesel's method was unusual. As early as 1941 or 1942 he and two of his students, Berry and Orland, all three being caries inactive, placed the incubated saliva of caries-active individuals in their mouths. They found that the microorganism in the saliva they placed in their mouths disappeared. Even when sugar was added these organisms disappeared in 24 hours. This indicated there was something in their saliva which overcame this bacteria. They found this to be aerogenes bacteria which were capable of producing ammonia. A great deal of experimental work in vitro (in test tubes) with saliva was performed. The problem was then presented as to how to raise the ammonium content of the saliva of caries-active individuals. Dr. Kesel had working with him Drs. Wach, Kirch, and O'Donnell, all of whom were connected with the College of Dentistry of the University of Illinois. They found that alkaline salts of ammonium when added to the saliva stimulated the aerogenes bacteria inhibiting lactobacillus, but that acid salts did not. They selected dibasic ammonium phosphate (hereinafter referred to as dibasic) as the preferred ammonium salt. From time to time in 1944 and 1945 patients with decayed teeth were referred to the group at the University of Illinois Dental School. It was found, with few exceptions, that patients who were administered dibasic had a lower lactobacillus count after three or four months use.

Sometime before the fall of 1945, Dr. Wach suggested the addition of urea to dibasic. In the fall of 1945 or early winter of 1946 tests were made using the combination of urea and dibasic. Their experimental work disclosed the supporting action between dibasic and urea. In the early part of 1948 in Peoria, Illinois I began study on school children which lasted for about two years. The tests were made with a combination of dibasic and urea dentifrice.

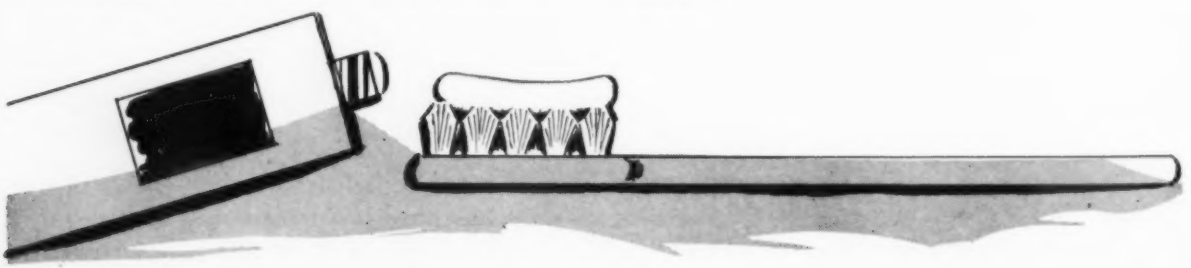
Dr. Kesel appears to have been the spokesman of the group. He reported the findings of the Chicago Dental Society on February 13, 1946, including the test with dibasic dentifrice on some 55 individuals. This report was awarded the annual prize of the Chicago Dental Society for research investigation. He next read a paper October 9, 1946, at Palm Springs, California, on the subject of "Ammonium Production of Oral Cavities and the Use of Ammonium Salts with Control of Dental caries." In this paper printed in the Journal of Oral Surgery, Dr. Kesel explained the experiments using urea and dibasic. He gave further lectures before Dental Societies and wrote various articles on the experimental work that had been done.

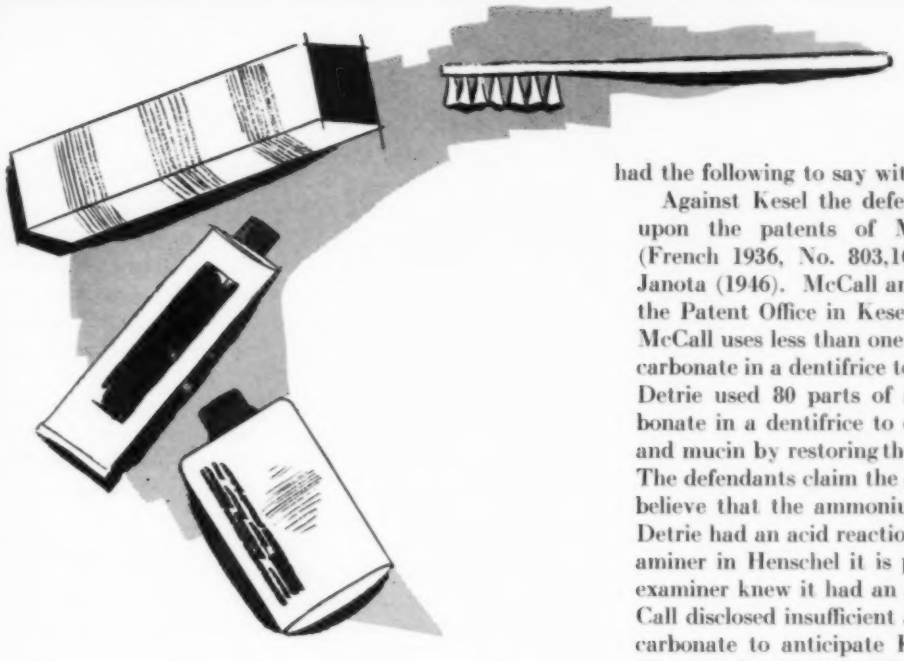
Dr. Henschel's Work

It appears that Dr. Henschl, a practicing dentist in New York City, delivered a paper in May 1945 before the Westchester Dental Society. The paper was printed in the New York Journal of Dentistry in March of 1946 being entitled "Caries Control by Chemical Prophylaxis." The paper contained a formula which included urea for use in a liquid dentifrice. It appears that Dr. Henschel had been doing some work using a dentifrice with a very high urea content but found it to be irritating.

The Legal issues

The U. of I. Foundation brought suit for infringement under the Kesel and Wach patents. Block and Amm-i-dent defended on the ground that the patents were invalid for various reasons which included the following:





1. The Henschel patent is entitled to priority over the Kesel and Wach patents.
2. The prior art anticipated the Kesel and Wach patents.
3. The patents in suit lack utility.
4. There is no evidence of synergism of Wach's combinations of urea and dibasic ammonium phosphate.

Block and Amm-i-dent also contended that they did not infringe, i.e., that their products were not covered by any of the claims of the Kesel and Wach patents.

Priority of Kesel and Wach vs. Henschel

Although Henschel's patent was applied for and issued prior to the Kesel and Wach patents the court held that Kesel and Wach were entitled to priority over Henschel. Both the Kesel and Wach patents stemmed from an original application of Kesel, Wach and two others, which latter application was filed prior to the Henschel application. In addition the court felt that Dr. Wach conceived the combination prior to Jan. 26, 1946. In coming to this decision the court noted that Dr. Henschel attended a meeting in Chicago where Dr. Kesel delivered a paper before the Chicago Dental Society on Feb. 13, 1946. It appears that Dr. Kirch, a collaborator of Dr. Kesel, was on the platform with the latter and was approached after the meeting by Dr. Henschel who inquired whether any work had been done using urea and dibasic. Dr. Kirch informed him that it had.

The opinion does not make clear how this evidence proves conception a month earlier than the delivery date of the paper, but presumably such evidence was in the case.

Prior Art

There were 13 patents and 41 publications cited by the defendants against the patents in suit. The court had the following to say with regard to the prior art:

> Against Kesel the defendants rely principally upon the patents of McCall (1929), Detrie (French 1936, No. 803,161), Cross (1934), and Janota (1946). McCall and Detrie were cited by the Patent Office in Kesel, Wach and Henschel. McCall uses less than one per cent of ammonium carbonate in a dentifrice to reduce mouth acidity. Detrie used 80 parts of ammonium sesqui carbonate in a dentifrice to dissolve salivary tartar and mucin by restoring the alkalinity of the saliva. The defendants claim the examiner was misled to believe that the ammonium sesqui carbonate in Detrie had an acid reaction. Before the same examiner in Henschel it is plainly shown that the examiner knew it had an alkaline reaction. McCall disclosed insufficient amounts of ammonium carbonate to anticipate Kesel. Cross used less than 4.2 of sodium phosphate in a dental preparation. Sodium phosphate may be distinguished from the more stable phosphate, dibasic ammonium phosphate. Sodium phosphate-monobasic consists of NaH_2PO_4, whereas, the formula for dibasic ammonium phosphate is $(NH_4)_2HOP_4$. There is also disodium phosphate and trisodium phosphate. No suggestion is made in the patent as to which of these is to be used. Janota speaks of using sodium potassium and ammonium. It also speaks of pyrophosphates. There is nothing definite in these terms which would teach the use of dibasic ammonium phosphate. It must be observed that Kesel taught the inhibition of lactobacillus and the stimulation of the aerogenes bacteria to get a natural production of ammonia to maintain tooth integrity. All of these patents were referred to by the same examiner in either Kesel, Wach, or Henschel.
>
> The publications relied upon principally as anticipating Kesel are Lichtenstein, Grove and Grove, Kesel, and Stephan. Dr. Edith Lichtenstein published a thesis in 1924 in which she found a relationship between the ammonia content of the saliva and dental caries. The defendants urge that this thesis suggests the introduction of neutralizing salts in the saliva. This court comes to no such conclusion. All Lichtenstein does is to confirm the relationship between the ammonia content in the saliva and immunity from dental caries.
>
> Grove and Grove conducted experiments on immunity and susceptibility to dental caries and published papers on the subject between 1934 and 1942. As early as 1934 Groves' paper emphasized that where the pH of saliva is above seven there are alkaline ammonium salts present capable of being an immunizing force against caries. Grove and Grove recommended .006 per cent of one per cent of ammonium. It was proven

(Continued on page 797)

Sebaceous Gland Secretion

by Joseph Kalish, Ph.D.

Sebaceous glands occur wherever there are hair follicles, which is all over the skin surface, with the exception of the palms of the hands, the soles of the feet, the spaces between fingers and toes and a few other locations. In a few instances, the glands occur separately from hair follicles, namely, at transition points from true skin to mucous membrane such as the lips.

The glands are largest in the forehead, face, neck and chest and are definitely smaller elsewhere on the trunk and extremities. In the scalp they are fairly large but elongated in shape instead of round as elsewhere.

The sebaceous glands are described as consisting of a number of lobes which develop from the hair follicle and partially surround it. A short duct connects the gland with the follicular canal and permits the sebaceous secretion to impregnate the hair shaft and the horny skin layer. The outermost cell layer of the glands (the basal layer) consists of flat cells; the next inner layers are composed of larger cells containing discrete particles of fat. Accumulation of fat increases in the innermost layers of the gland until the cell membranes and protoplasmic meshwork break down to be replaced by an amorphous fatty mass, which diffuses into the duct and reaches the skin surface.

This secretion, or more properly excretion process is characteristic of holocrine glands, multiple layered glands in which the total disintegration of cells gives rise to the excretion, with basal cell protoplasm being rapidly transformed into a mixture of lipids.

Skin surface fat may arise from two sources, keratinizing cells and sebaceous glands. The former is relatively small, and sebaceous gland secretion seems to be unique in that it is part of an equilibrium process. When the skin surface is defatted by lipid solvents or emulsification, sebaceous excretion begins at a high rate and then tapers off to a minimum and may stop entirely after two or three hours. The rate of flow h s been related to the thickness of the sebaceous layer, which is related to the viscosity of the excretion. This is less as the surrounding temperature is higher. Sweating will also affect the thickness of the fat layer, which can be emulsified by moisture and will thus spread more readily.

An equilibrium has been proved between the excretion pressure, which depends upon the size of the sebaceous gland, and the combined thickness and viscosity of the skin surface fat layer. The larger the gland, the greater its excretion rate, and this is counterbalanced by the pressure exerted by the skin fat layer which in turn depends upon the thickness of the layer and its viscosity. At low temperatures, when sebum is quite viscous, thinner layers will serve to stop sebaceous gland excretion. At higher temperatures, where the sebum may be so thin as to flow, especially when emulsified by perspiration, back pressure may not build up and the glands will continue

COURTESY DOROTHY GRAY

relatively copious excretion.

The minimum excretion rate for the whole body surface has been estimated to be about 0.2 mg. per minute or 12 mg. per hour, but this minimum value is probably considerably smaller than the actual average rate.

Since the excretion rate is directly related to the size of the sebaceous glands, it is not surprising that excretion is greatest on the forehead, where the underlying glands are largest and is in fact about three times as great as on the forearm. Over all, regional sebaceous secretion closely parallels the distribution of perspiration.

In normal individuals, both male and female, skin surface fat is low in childhood and rapidly increases with the approach of puberty to attain a relatively constant value throughout maturity. Although the available data lacks statistical significance, there seems to be room for an impression that male skin fat is slightly greater than in females. With advanced age, sebaceous secretion seems to remain about the same in men, but is definitely less in old women.

Concerning the effects of food intake on skin oiliness, forced feeding of animals with fats will increase sebaceous secretion, but this is an abnormal situation. Nevertheless, in human beings, normal and those with acne, excess fats *and* excess carbohydrates in the diet led to increased levels of sebum on the skin. Subjective observations have long suggested this phenomenon and possible utilization of diet to correct excessively dry skin, but excessive caloric intake would certainly lack popularity among those seeking to lose weight.

There is at present no conclusive evidence that sebaceous gland secretion, as contrasted with perspiration, is affected by nerve action. In some disease conditions of nervous origin or with nerve involvement, there seems to be disturbance in sebaceous gland activity, but this is difficult to separate from disturbance of the sweating mechanism.

There is ample evidence, however, that the oiliness of the skin is very definitely affected by steroid hormones.

At puberty, when directly active sex hormones first appear in the body, both boys and girls exhibit increased sebaceous gland excretion along with increased sebaceous gland volume. In those cases where the activity and volume are excessive, acne may appear. This increased skin oiliness in males can be readily attributed to the presence of testosterone, the

(Continued on page 850)

TASTE PANELS for

by Victor G. Fourman, Ph. D.,

PRESIDENT, SYNTOMATIC CORPORATION

COURTESY ELI LILLY AND COMPANY

Assuming that two or more different types of flavors are suitable for masking the unpleasant taste of a given pharmaceutical, how can it be determined which is more effective? If two flavors have approximately equal masking power, which should be chosen because of greater consumer appeal? On what basis are such selections made? Competent sources maintain that some flavors have greater appeal in one part of the world than in another; that among some age groups there are definite preferences as compared to other age groups. Such claims should be examined and weighed in the light of all possible evidence.

Our two chief problems are: (1) which type of flavor is most suitable for a given pharmaceutical; (2) what strength and character are most appropriate once the type has been chosen. It is important to know what to reject as well as what to select. The decisions, though not necessarily the correct ones, can be made by an individual, a few experts, a small trained panel or a large consumer panel. An ideal condition is one where all methods lead to the same choice, but this result is rarely attained unless the accepted flavor is so superior that a panel is not necessary.

Few decisions of importance are made today by one person, so that this category can be dismissed from the discussion. The type of panel used depends on the purpose of the tests; the methods of selecting members for the panel depend on the kind of panel. In certain fields small trained panels of a few experts are of real value. Burrows[3] states that deodorized fats can be accurately classified by a tasting group of three or four individuals. Panels with few members are relied upon for grading such commodities as tea, coffee, and wine on the basis of taste. Sometimes even a single person makes the final choice. However, although a specialist in his own field, his opinion may have little value in other fields. An expert may know much about the aromas of fine coffees but little about the aromas of fine vanillas. In the field of pharmaceuticals, flavor tests can yield some startling and sometimes disastrous results when the panel consists of medical and pharmacological experts unless these investigators have real experience in the physiology and chemistry of taste.

Taste panels of various types have been employed in the food and beverage industries for many years

Pharmaceutical Flavors

but their use in the area of orally administered therapeutics is a recent development presenting many difficulties. As in all scientific work, it is not enough to obtain results; the validity of the findings must be established. Selection of panel members, mathematical treatment of the statistics and their proper interpretation require the use of probability theory.[10] It is most important to consider the size and composition of the panel. Some qualified writers believe that a small group of trained observers can predict preferences more in harmony with that which consumer acceptance will ultimately reveal than can a large group of untrained subjects. Others think that each type has its own particular function. A small, expert panel generally consists of about a dozen persons unless a specific commodity such as tea or coffee is being tested, when fewer members are adequate. According to Hedlund[8], this type of panel is used primarily for determining whether or not differences in taste exist. "To date Taste Panels can tell us if differences exist, not what the consuming public likes." Such panels, properly organized, can find that the difference between two flavors for a given pharmaceutical product is the result of one being stronger or one being less sweet than the other, but these panels are not able to predict what the public will prefer. Both the trained taste panel and the so-called consumer panel have their functions but there must be no confusion about them. The former primarily determines whether two flavors are identical or different from each other. Trained taste panels should not consist of flavor experts any more than intelligent juries should consist of legal talent. On the other hand, they should be composed of individuals who do possess a good sense of taste and smell and a clear understanding of the objectives of the tests, otherwise their opinions will lead to nothing but random guesses.

Such taste panels for the detection of differences are usually selected from a larger group of candidates by various screening processes. To a great extent keenness of taste-sense can be determined by the triangle and the duo-trio tests. In the first, the candidate is asked to make a selection from three flavors, two identical and the third different. The difference must not be so small that too much difficulty is encountered in making the choice. In the duo-trio tests the potential member selects from two samples, one which matches a third. These tests are conducted with a series of flavors and repeated enough times to obtain a significant average. Those who score highest

(*Continued on page 865*)

COURTESY TEA COUNCIL OF THE U.S.A., INC.

CLEANSING LOTIONS

by Harry Hilfer

The cleansing creams are preparations familiar to most women and have been an integral part of the general cosmetic line for as long as most of us can remember. The creams appeared in a variety of different forms, most of them however were variations of the well-known beeswax-borax-oil formula in which was contained perhaps 60-65 per cent of oil. The cream picks up the oil-soluble and oil-wettable soil deposited on the face by exudation or by other means, with the assistance of the emulsifier present—in this case the sodium cerotate formed by the reaction between the borax and cerotic acid present in the beeswax.

The trituration accompanying the act of application usually introduced enough mechanical work to accomplish the incorporation of the soil. The film was then wiped off with tissues and thus the soil was removed. This method has remained an almost standard procedure for a long period of time. There have, however, been introduced recently some new preparations —some based on the old creams and some used in conjunction with water which may cause the older preparations to be looked at as somewhat old fashioned. This trend was started some time ago and there seemed to be a noticeable drift away from creams as such towards liquids, usually in emulsion form. Many of the newcomers are adaptations of the older cold creams in a liquid form—but others are actually principally wetting agent and detergent mixtures adapted for use as facial cleansers. This latter is somewhat new and bears watching.

In the formulation of the oily type of facial cleanser, there are a large number of emulsifying agents now available which could be used with advantage, so that either a water-in-oil or oil-in-water emulsion could be made and still be substantially liquid in its character. If we were to start with a beeswax-borax emulsion containing perhaps ten percent of beeswax we would expect a cream rather than a liquid lotion. The addition to the preparation of a small amount of a polyethoxylated alcohol, however could easily cause the cream to liquefy and then by further alterations it is possible to obtain a liquid counterpart of the cleansing cream, though the amount of oil may have to be reduced if it is to be a stable oil-in-water emulsion.

There are a large number of emulsifiers developed in the last twenty years and now commercially available which enable the formulator further to enhance his preparations. The nonionic preparations particularly may be used in this connection with advantage. In general, hydrophilic properties of these compounds may be controlled by the length of the hydrophilic group introduced. Ethylene oxide or ethylene glycol is the most common substance used since the length of the polymerized chain is so easily controlled and because the polymer contains a rather large percentage of oxygen which endows it with its hydrophilic properties. These substances used in cooperation with the older and perhaps better known emulsifiers, or in con-

COURTESY TUSSY COSMETIQUES

junction with each other (emulsifiers containing varying chain lengths of the hydrophile) may impart the desired property. In addition since they are good wetting agents, their presence will make the skin more easily "wetted" so that the soil may be more easily drawn into the emulsion with trituration.

This method of procedure is in line with the system proposed by Griffin in his paper "Classification of Surface Active Agents by HLB," Journal of the Society of Cosmetic Chemists—Vol. 1, No. 5, December 1949, in which he proposes a grading system for emulsifiers so that they may be evaluated for use in specific emulsions. Griffin's work is of great value in fixing these values when it had been the practice to arrive at the correct result by trial and error and if this work is continued we may in time have a tablulated value for each substance to be emulsified. In general, however, what is being done is to mix emulsifiers together so that the best stability may be obtained.

Substances such as glyceryl monostearate or cetyl alcohol, in addition to the polyethoxylated alcohols, have a marked effect on the stability of the emulsion, and my own feeling is that these stabilizers are of the utmost importance in arriving at suitable stability, particularly if the stability is expected to hold over a broad temperature range. Beeswax-borax emulsions need not be the principal agency used in alteration. Indeed, other emulsifiers may function better in the liquid emulsion preparation. The system was used merely as an example.

When the dispersed phase in the oil-in-water emulsion amounts to perhaps 50 per cent of the formula we must also be prepared for differences in behavior. At this point the colloidally dispersed particles begin to crowd each other and may therefore cause the emulsion to thicken to an undesirable extent. If the emulsion is stirred at room temperature it usually thins somewhat

(Continued on page 838)

BETTMAN ARCHIVE

by Dr. Ernest H. Volwiler

RESEARCH in the

Our modern way of living is based largely on scientific research. We in these United States spend for research and development a higher percentage of our national income than any other country in the world. For industry in general, these expenditures amount to about one per cent of national income; but in the drug manufacturing industry approximately five cents of each sales dollar is spent for research and development.

Every day in our land some 1,100,000 prescriptions are filled. The total annual value of these prescriptions is close to one billion dollars. This large sum represents active research and very keen competition.

No one knows when studies of drugs began. The aborigine accidentally discovered that some plants and extracts made from them had certain specific physiological effects in human beings. Later, in the middle ages, some of the more imaginative alchemists, apothecaries, and physicians—like Paracelsus—got the glimmering of the idea that to make an effective drug was a nobler object than to transmute base metals into gold.

Scientific drug research as we know it now had its beginnings only recently. Quinine for malaria, mercury for skin diseases, extract of poppy blossoms for pain—these were old drugs whose discoveries were hidden by the centuries. But modern general anesthesia, starting with chloroform, ether and nitrous oxide, is just a little over a hundred years old. Progress after that time was still halting and slow, partly because there was no concerted effort by scientists as there is today, and partly because the knowledge of science and technology was still very limited. Shortly after the Civil War it was observed that sleep could be produced by chloral hydrate. Later still came aspirin and phenacetin for pain, anesthesin and procaine for local anesthesia, barbiturates for sleep, and glandular extracts from the by-products of the slaughter house for a variety of purposes.

The golden age of drug research may be said to have begun about 40 years ago. In succession came insulin, new barbiturates for inducing sleep, germicides, intravenous anesthetics, the sulfa drugs, and penicillin and other antibiotics. The last decade has brought forth the steroid hormones like cortisone, compounds to control epilepsy, synthetic and natural drugs for use in mental illnesses, antihistamines to control allergies, vaccines against dread diseases like polio, and new antibiotics of a potency undreamed of a few years ago. Even some of the toxic war gases have been harnessed and made to play their roles in medicine. Swords have been beaten into plowshares. Nowhere has this been so striking as in the use of radioisotopes in medicine for both diagnosis and cure of disease. Radioisotopes of most of the elements can exist, but

*Before Industrial Council, Rensselaer Polytechnic Institute Oct. 28, 1955.

there is only a limited number that appear to have interest in medicine. Among them are radioactive phosphorus, iodine, chromium, gold, and cobalt. Compounds containing these isotopes can be made to fit particular needs. Radioactive phosphorus checks the overproduction of red blood cells in a form of cancer of the blood; radioactive iodine is used for determining thyroid function and for treating thyroid disease; other radioactive compounds can be used to measure the total volume of blood in a patient, or his plasma volume, or cardiac output and circulation time, or liver function, or to diagnose pernicious anemia, or to show exactly where a brain tumor lies.

What are the steps that must be taken to develop a new drug? The gauntlet that it must run is an increasingly long and difficult one. First of all, the idea must hatch in some fertile and prepared mind. It can come only from an individual, not from a crowd. Before an idea can finally be put into practical use, teams of scientifically and technologically trained men and women will have to work on it, but in the original inception of the idea the lone individual mind is and will always remain supreme.

You have heard of valuable drugs which were discovered by accident. There have been a number of such discoveries. In most cases of this sort, particularly in recent years, the investigator was looking for a drug for some specific disease, but the product he made was found to be useful for something else. This is called serendipity. Pasteur expressed it this way: "Luck favors the man who is prepared."

The hypothetical new drug which we are talking about may come from a variety of sources. It may be a synthetic chemical; organic synethsis has been the source of many of our most valuable drugs. Or it may be a product obtained by extraction from a plant like the alkaloids morphine and reserpine; or from animal glands like thyroid extract or insulin. The drug may come from the laboratory of the microbiologist who is responsible for antibiotics; it may be a vaccine against smallpox or polio for which we depend on the bacteriologist.

After the new drug has been made by the researcher, tests begin for effectiveness and safety. This may involve bacteriologic evaluation, and certainly pharma-

(Continued on page 856)

Pharmaceutical Industry

COURTESY CHAS. PFIZER & CO.

CETYL ALCOHOL:

Origins and Uses

by Arnold J. Frankel

When a French chemist by the name of Chevreul discovered cetyl alcohol over 100 years ago, little did he dream that it would someday gain the wide popularity that it enjoys today in the fields of cosmetology and pharmacology. The Greeks had a word for it indeed: based on its origin from sperm whale oil, the name cetyl, derived from the Greek "Ketos," meaning whale, evolved.

Two important properties of cetyl alcohol account for much of its wide use. They are its useful skin emollient property combined with its ability to improve the general quality of a cosmetic emulsion: i.e. to act as a good water-in-oil emulsifier. These properties make it particularly interesting in the formulation of creams and ointments of many sorts: lubricating creams, vanishing creams, cleansing creams, cold creams, hormone creams, medicated ointments, etc.

Cetyl alcohol, because of its emulsifying properties, permits and facilitates the incorporation of water into creams containing various hydrocarbons such as mineral oil, paraffin waxes and petrolatum. In the emulsification process, the reduction of interfacial tension assists in the formation of emulsions that remain stable, virtually eliminating "weeping" or water exudation. Cetyl alcohol also helps suppress evaporation of water from a cream.[1]

In addition to the properties already mentioned, cosmetic creams require the inclusion of an ingredient that will impart a pleasantly smooth texture to the finished product but will not be greasy. Cetyl alcohol meets this requirement, and is also white in color, cannot turn rancid because, as a saturated alcohol, it contains no double bonds, has a melting point of approximately 48° C. which permits ease of formulation and application, and is dermatologically innocuous.[1a,5,6,7,8] In addition to all these desirable properties, our 16 carbon, straight-chain monohydric alcohol, $C_{16}H_{33}OH$, is reasonable in price; i.e. within the range acceptable to the cosmetic industry, about half a dollar a pound. When this material was scarce immediately after World War II, its importance to the cosmetic industry permitted it to fetch prices well over a dollar a pound in some instances.

This interesting product can be produced by processing fatty esters found in nature: either of animal or vegetable origin.

Cetyl Alcohol from Sperm Whale Oil

The sperm whale is the main source of cetyl alcohol of animal origin. This mamal, known to biologists as Physeter Macrocephalus L. is found chiefly in tropical waters, although stragglers are sometimes found in both the Arctic and Antarctic Oceans.[2,3] The sperm whale, numerically, is but a small minority in the larger community of whales. The normal "whaler's whale" is a member of another group, the rorqual family, and the sperm whale is not normally sought by most whaling expeditions, which operate in colder waters.

When a sperm whale is caught, it is often preliminarily processed aboard ship, where there are facilities for dissecting the sperm whale, removing sperm oil and subjecting this oil to preliminary physical separations. Sperm oil is found in several parts of the animal: the head cavities, blubber, meat and bones. Crude sperm oil contains about 10 per cent of spermaceti, which settles out of the liquid portions.

and may be pressed or filtered from the liquid for complete separation. The spermaceti, which is chemically cetyl palmitate, may itself be further processed by saponification to produce cetyl alcohol and palmitic acid. The palmitic acid can again be further processed by hydrogenation or sodium reduction to produce additional cetyl alcohol.

So far, we have discussed only the spermaceti portion of the sperm whale oil. The remaining oil contains mostly cetyl esters of primary C_{18} unsaturated acids, such as cetyl oleate. By saponification with sodium hydroxide, a mixture of fatty acids and alcohols is obtained, chiefly oleic acid (soap) and cetyl alcohol. These are separated by distillation. The cetyl alcohol thus separated from the oleic acid by distillation may be redistilled to obtain the purity required for a good quality cosmetic product. In its final shippable form, it is either in blocks, carefully and individually wrapped, or the alcohol may be flaked, or even melted into drums and shipped as a solidified mass.

The remaining oleic acid can be reduced to oleyl alcohol, or further reduced to stearyl alcohol, a saturated C_{18} alcohol.

Cetyl Alcohol from Vegetable Oils

The most important oils from which cetyl alcohol is derived are coconut oil and palm kernel oil. These oils are glycerides of fatty acids: mainly glyceryl tristearate, glyceryl trioleate and glyceryl tripalmitate, which are known respectively as stearin, olein and palmitin, but other fatty acid groups are also present. Those mentioned contain 16 or 18 carbon groups, but C_8 (Caprylic), C_{10} (Capric), C_{12} (Lauryl), and C_{14} (Myristyl) groups are also present. The C_{18} groups, as indicated from the nomenclature above, contain both saturated and unsaturated groups. The C_{12} group, however, predominates.[4]

Saponification of the glycerides will produce glycerine and a mixture of fatty acids as just outlined. The fatty acids can then be reduced to the corresponding alcohols by catalytic hydrogenation under high pressure, or by sodium reduction. The cetyl alcohol fraction can then be separated from the other alcohol fractions by distillation and formed to either the block or flake form, as with the sperm oil product.

Tallow, which is chemically similar to the glycerides of the above mentioned oils, is also used as a source of cetyl alcohol and other fatty alcohols. It is becoming more important because of its lower base cost, as well as its increasing availability. As a food by-product, more tallow is available when more farm animals are grown, whereas the availability of sperm whales, by comparison, is relatively inflexible.

In the drug and cosmetic field, cetyl alcohol must be purified to meet certain standards that the trade has accepted. There is an N.F. specification, as well as the more rigorous one set up by the Toilet Goods Association. These may be outlined as follows:[9]

	T.G.A.	*N.F.*
Solubility	In ethanol, ether, chloroform and toluene	In alcohol and ether
Melting Point	47 to 49°C.	45 to 50°C.
Acid Number	0.5 maximum	2.0 maximum
Saponification No.	1.0 maximum	.....
Iodine Number	3.0 maximum	5.0 maximum
Hydroxyl Number	218 to 232	218 to 238
Ash	0.05 per cent maximum	.....
Lead and Arsenic	p.p.m. maximum each	.....
Distillation Range	.....	Min. 90 per cent between 316°-336°C

In addition, odor is an important factor. Although subjective to be sure, each cosmetic formulator knows his cetyl alcohol by its odor, or lack of odor, and often will choose his brand on this basis after his other specification requirements are met.

Typical formulas incorporating Cetyl Alcohol are as follows:[10,11,12]

1. *Cleansing Cream*

Beeswax	9.0	Borax	0.6
Paraffin Wax	10.0	Water	34.0
Cetyl Alcohol	1.0		

The Cetyl Alcohol added acts as an emulsifier and prevents "weeping."

2. *Liquefying Cream*

Cetyl Alcohol	5.0
Petrolatum	25.0
Mineral Oil	45.0
Water	25.0

A softer product than the cream of No. 1 (Cleansing Cream) is produced by removal of higher melting waxes and replacement with petrolatum and mineral oil.

(Continued on page 855)

BETTMAN ARCHIVE

Our Smallest Servants . . .

Where is it all leading?

It is still too early to tell. Despite its accomplishments, fermentation chemistry is barely out of grade school. For instance, only a small fraction of the hundred thousand known species of fungi have been thoroughly tested. Any day, some research scientist may develop an antibiotic which will attack disease germs outside the present spectrum. The organism may differ greatly from the Penicillia *and* Streptomyces, *which have been getting the major share of attention.*

The discovery may come tomorrow, or it may take years. In the United States alone, there are 2,974,726 square miles of land. Any pinch of that nearly limitless soil may offer the new organism whose life activity can be harnessed to produce the drug to conquer cancer or the common cold or other diseases which, as yet, have not succumbed to man's efforts. At this point, only one thing is sure: these diseases will be defeated.

It is safe to predict that with biochemical engineering and man's expanding capacity for daring research, the future of humanity is one of greater physical well-being, less disease, better food, and longer life.

The aging of meat and the manufacture of alcohol were the first unconscious uses of the process now called fermentation. Primitive man did not know he was profiting from the natural activity of tiny living organisms, such as molds and yeasts.

Without even knowing that the creatures existed, ancient man learned to put them to work. The crude, earthen pot of the Egyptian brewer was the lineal ancestor of the magnificent, gleaming vat that stands four stories high in a modern chemical plant. The haphazard fermentation process by which yeasts digested grain and gave the Pharaoh his cloudy, unreliable beer was the forerunner of the carefully controlled processes by which microorganisms produce many of our most important drugs and most valuable chemicals.

The ancient art of cheese making involves the fermentation of milk or cream. For thousands of years, the soy sauces of China and Japan have been made from fermented beans. For centuries, Balkan peoples have enjoyed fermented milk, or yoghurt, and Central Asiatic tribesmen have found equal pleasure in the sour, alcoholic mare's or camel's milk called kumiss.

*Abstracted from "Our Smallest Servants," published by Chas. Pfizer & Co.

Bread, almost as old as agriculture itself, and used in some form virtually everywhere on earth, involves a yeast fermentation.

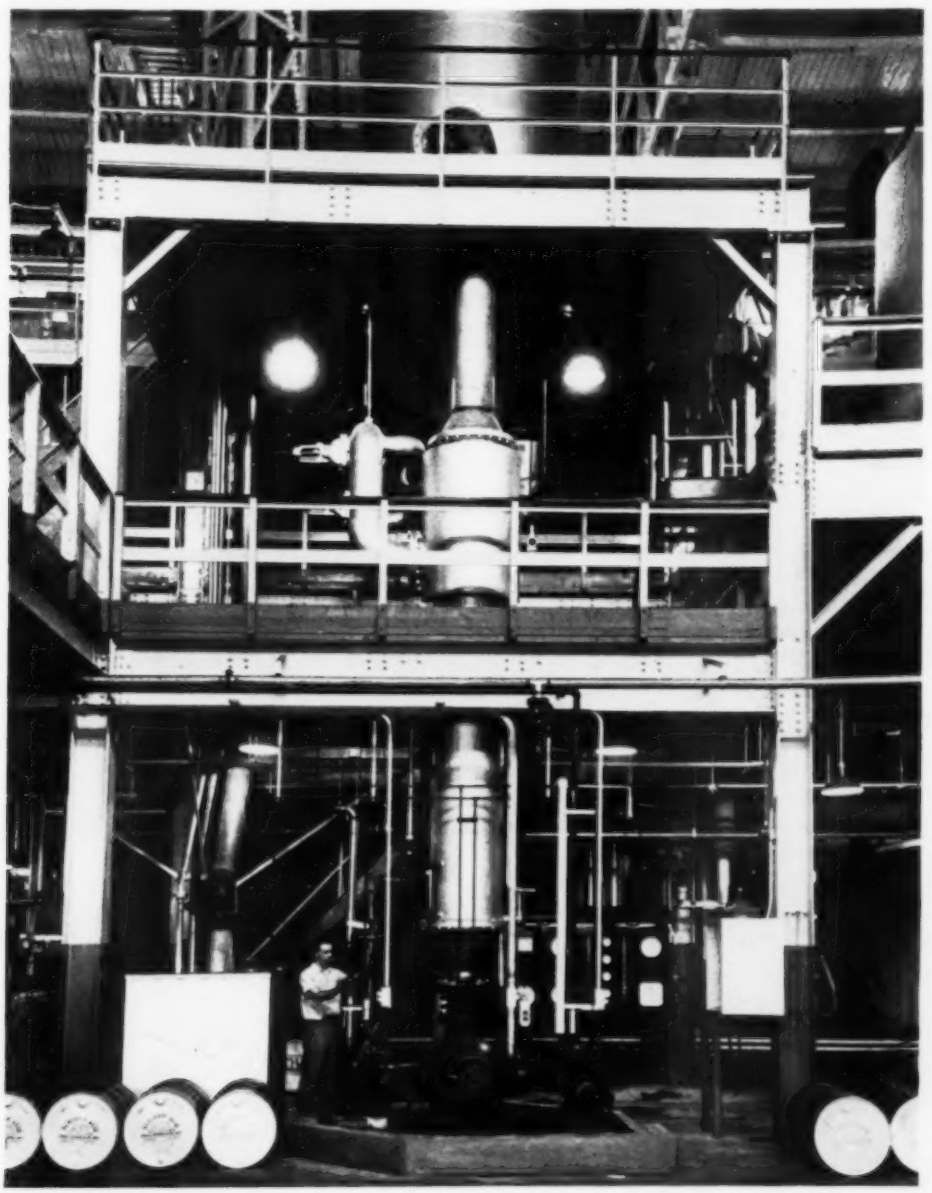
Wine probably dates from the delight with which some of our unknown ancestors ate fallen, fermented fruit on which yeasts had been living. Beer is only slightly less ancient than wine.

During the Middle Ages, experimenters learned how to improve the taste of wine, bread, beer, and cheese, but they had no idea that in so doing they were dealing with a form of life. The first to suggest that microscopic organisms caused fermentation was a French scientist, L. J. Thenard. In 1803, Thenard announced that the yeasts used by wine makers were alive and were responsible for the formation of alcohol. His findings were rejected by supporters of the more conventional notion that fermentation was a "pure" chemical action in which living things played no role, but Thenard finally was upheld. Louis Pasteur in 1857 proved that alcoholic fermentation is brought about by yeast and that yeasts are living cells, and managed to impress these revolutionary facts upon the most influential of his scientific colleagues.

Pasteur pressed onward and studied the soil of graveyards. He discovered that when dangerous germs are introduced into soil they last only a few hours. With typical insight, he concluded that the germs were killed by some of the other microbes with which the earth teems.

He then made another discovery. A bottle containing specimens of the bacillus which causes anthrax in

(Continued on page 859)



Pharmaceutical Patents

The free-for-all in pharmaceutical patents is rapidly reaching the point of absurdity. Almost everybody and his brother who are trying to keep in the van so far as the latest in drug therapy is concerned, are either suing, or being sued, or both. There seems to have arisen within the industry quite a complete disregard for patent rights on the one hand, and a general assumption that process patents are being violated, whether or not this is the fact.

There is no question that coincidence plays a strange and important part in the matter of original discoveries. One has only to become acquainted with the almost simultaneous discovery of isoniazid by Hoffmann-La Roche and E. R. Squibb & Sons to know that two different groups of scientists can come with the same thing at the same time. In this case the matter was amicably resolved by the two companies agreeing to cross-license each other before the dates of discovery were exposed. In this case Hoffmann-La Roche proved to have the earlier date, and Squibb stepped aside while the patent was granted to Hoffmann-La Roche. A similar method of resolving the patent claims on tetracycline of Chas. Pfizer & Co. and Lederle Laboratories was followed, and Lederle conceded priority to Pfizer.

But patent law is a peculiar thing and the validity of patents can turn on points which at times appear quite remote from the question of the actual discovery of the product in question. The conduct of the holder of a patent in merchandising the product or products made under the patent can invalidate the patent. The type of control which the patentee seeks to exercise over his licensees can also invalidate a patent. Also relationship of the patented product to earlier products can cause a product upon which a patent has been granted by the Patent Office to be declared by a court not to constitute invention.

There have been cases in which a patent was invalidated because the patentee attempted to control prices charged by the licensees for the product involved. There have been cases in which a patent was invalidated because the patentee attempted to control prices charged by wholesale and retail distributors of his product or products. The Steenbock patent on irradiation of ergosterol to obtain synthetic vitamin D was invalidated on the contention that this same process had existed from the earliest times through the fact that the sun's rays have the same effect.

For this and other reasons, it is considered much better if the holder of a patent is not required to defend his patent in the courts. Also, holders of patents do not like to go too high in the courts for the reasons that the validity of a patent seems to have less chance of being upheld in the higher courts than in the lower courts. If a patentee can win the decision in the Circuit Court of Appeals he is considered well off. However, the real test comes if an appeal to the U. S. Supreme Court is made. If certiorari is denied then the patentee is indeed lucky for very few of these patents seem to be upheld by the Supreme Court if they are reviewed there.

The sad part of the controversial patent situation is that it has created much ill-feeling among many companies in the industries, and this sort of thing is bound to be harmful to the industry in the long run if it is allowed to continue. One thing that must be realized is that the doctors who prescribe the drugs covered by patents are not interested in patents and care very little about the patent rights of the manufacturers. They are interested mainly in prescribing products that will give the desired results. They care not who makes them if they are what is desired and if the results of their use are satisfactory. As a matter of fact, many doctors resent the idea of large pharmaceutical companies having monopolies on drugs which are essential in the control of important diseases which represent outstanding public health problems.

The average drug retailer likewise has little or no interest in patents. He also is likely to feel that patents on important products result in monopolies which breed high prices which he has to charge for these drugs when they are prescribed. He does not like this because he is suspected of charging too much for the prescriptions which he fills. Sometimes he is questioned on this matter and passes the blame back to the manufacturer by claiming that

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Packaging and Selling

Pictured here are some of the 150 competing packages which the four judges are looking over in regard to the 1955 Aerosol Packaging Contest sponsored by the Chemical Specialties Manufacturers' Association. Left to right are Hoyt Howard, art director, Hoyt Howard, Inc.; Max Brown, director of sales and advertising, Fels & Co.; Michael Meisler, buyer for Saks Fifth Avenue; and Robert P. Long, editor and publisher of *Gravure Magazine.*

Results of the competition were announced on December 6 at the Hotel Roosevelt, New York, during the 42nd annual meeting of the Association. This is the fourth year that this group has sponsored the contest.

There were ten product classifications in all, and one winner was picked from each of the groups which included room deodorants, paint products, miscellaneous household products, shave products, hair preparations, miscellaneous personal products, glass and plastic containers, artificial snow, and industrial products.

For a list and a picture showing the winning aerosol packages, see page 777.

OWENS-ILLINOIS ASSURES YOU A

Co-ordinated Research

Pure research into formulae and fabrication of glass, *packaging research* into processing and handling methods in customer plants, and *market research* into consumer attitudes, add up to greater specific value for your packaging dollar.

Engineered Design

The package that takes your product to market must take *three* needs into account. Considerations of its function in the retail store, its operating efficiency and its consumer utility all become a part of the prescription for an Owens-Illinois package.

The Right Container

Versatility of facilities and talents points to Owens-Illinois as your best source of supply for a wide range of specialized needs: Containers where beauty, utility and tradition are blended in the proportions required by different product classifications.

Petite Loveliness to

COMPLETE PACKAGING APPROACH

The Right Closure

Know-how as to the best available liner and closure—best for packing, displaying, or using a specific product—may well be one of the most important single points through which expert packaging counsel will reward you many times over.

Needed Fitments

With emphasis on the word "needed," Owens-Illinois fitment specialists are keenly aware of sales benefits possible through use of fitments which are not "gadgets" but which basically increase consumer satisfaction with your product.

Merchandising Cartons

Modern cartons are developed only through systematic consideration of their opportunity to serve you in the retail store and retail warehouse as well as on your own filling line and in transit. Owens-Illinois is pioneering such developments.

He-man Handiness...

Duraglas salesmaking packages can express the personality of any product

THERE'S NO DOUBT ABOUT IT, sales are made by the beauty and convenience of the package. It's the first impression the customer gets of your product.

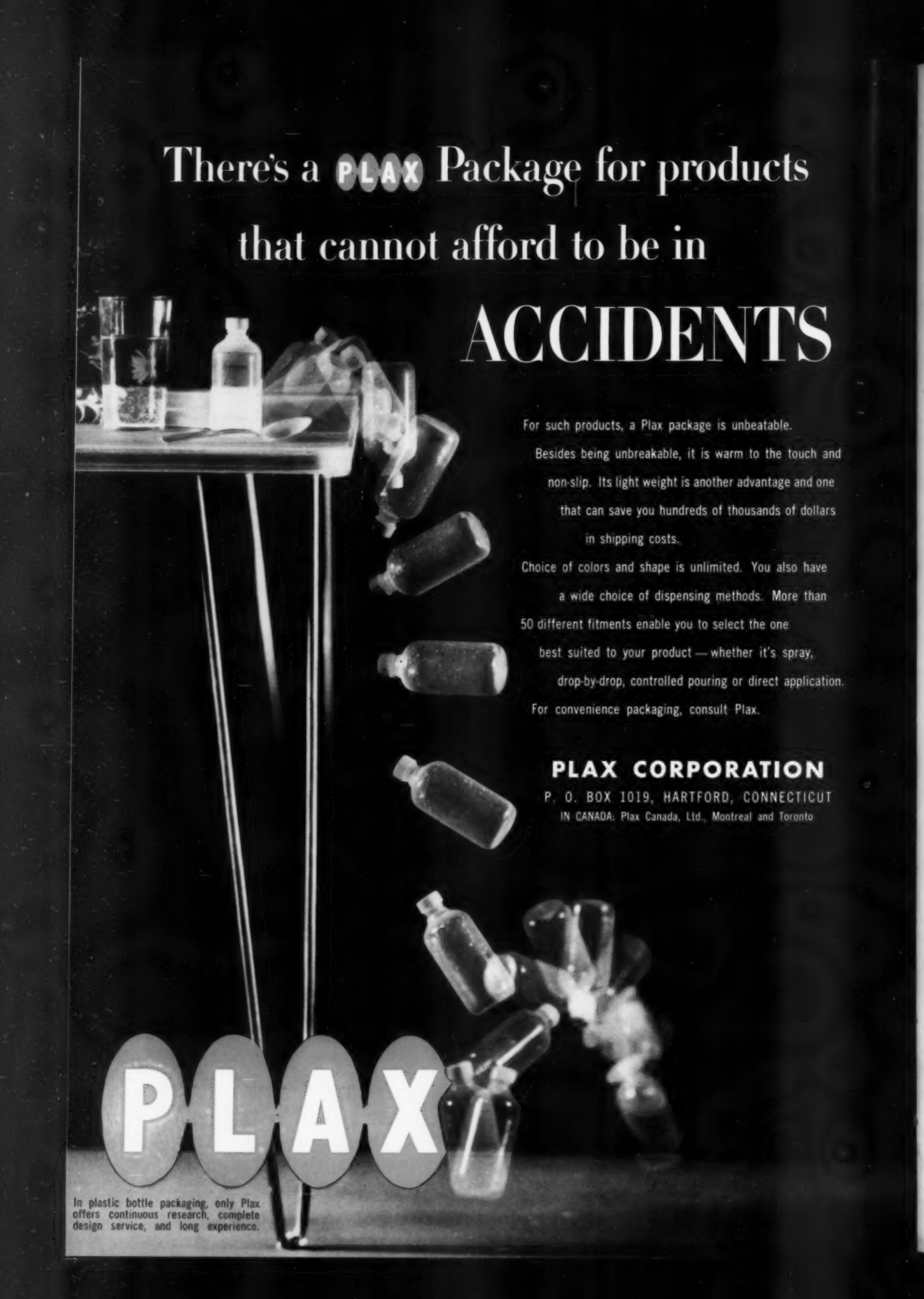
So at Owens-Illinois, SALESPACKAGING has been developed to its highest degree—by specialists in design, engineering and marketing.

The character of your product may call for especial beauty and grace in the container. Its use might be aided by the bottle's form or a special fitment.

So look to Owens-Illinois as a marketing-minded supplier of glass packages of all types, capacities and designs both stock and custom.

DURAGLAS CONTAINERS
AN (O) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO


There's a PLAX Package for products
that cannot afford to be in
ACCIDENTS
For such products, a Plax package is unbeatable.
Besides being unbreakable, it is warm to the touch and
non-slip. Its light weight is another advantage and one
that can save you hundreds of thousands of dollars
in shipping costs.
Choice of colors and shape is unlimited. You also have
a wide choice of dispensing methods. More than
50 different fitments enable you to select the one
best suited to your product — whether it's spray,
drop-by-drop, controlled pouring or direct application.
For convenience packaging, consult Plax.
PLAX CORPORATION
P. O. BOX 1019, HARTFORD, CONNECTICUT
IN CANADA: Plax Canada, Ltd., Montreal and Toronto
PLAX
In plastic bottle packaging, only Plax
offers continuous research, complete
design service, and long experience.

Aerosol Competition

The ten winning aerosol entries, four of which are cosmetic products.

Winners of the Chemical Specialties Manufacturers' Association annual aerosol packaging contest were announced December 6 at the 42nd annual meeting in the Hotel Roosevelt. Of the 150 packages entered, ten were singled out, with Sears, Roebuck & Co.'s Cross Country Rose and Floral Spray receiving the Grand Award.

Among the remaining nine prize winners, four packages were cosmetic items.

In the Glass and Plastic Containers classification, Ambush Spray Cologne, product of Dana Perfumes, Inc., was the top entry.

For Shave Products, Colgate-Palmolive Co. won with its Palmolive Rapid Shave Lather Cream.

In the Hair Preparations category, Elizabeth Arden received an award for its Blue Grass Hair Spray.

Walgreen Drug Stores won an award in the Miscellaneous Personal Products category for its Xpose Suntan Cream Lotion.

The Award plaques were presented to these winners, and to the remaining five which were in other fields—Christmas Snow, Rust Veto, Fire Chief, Jetco Air Freshener and Dupli-Color Spray Lacquer—by Fred G. Lodes, chairman of the CSMA Aerosol Awards Committee. All of the 150 packages entered in the contest were shown in an Aerosol Festival display during the annual meeting, which extended from December 5th to 7th.

CROWN CLOSURES

for better sealing—

Crown's long experience in the science of sealing, its exceptional skill in precision manufacture and its careful maintenance of correct tolerances are your assurance of trouble-free application on your containers. A wide variety of liner materials, many of which are exclusive with Crown; a tremendous store of data on the suitability of various liners for specific products; and unsurpassed Customer Laboratory Service are other reasons why it pays to make Crown your "sealing headquarters."

LABORATORY SERVICE

Crown maintains two laboratories. One for research and development, the other as a customer's consulting service. The services of the latter are available without cost to help packers select the closure and liner best suited for their individual products.

for better selling—

Crown Closures give consumers all the protection they expect . . . the kind of convenience they want. These caps are easy to remove . . . easy to replace . . . make a perfect re-seal over and over. In order to help your product sell on the store shelf, Crown's Art Department will assist in creating an attractive, attention-getting design for your closures.

DESIGN SERVICE

Customers of Crown may use without cost the services of a comprehensive design service. New designs will be created or adapted from present labels or trademarks.

CROWN CORK & SEAL COMPANY, INC.

Closure Sales • Baltimore 3, Maryland

World's Largest Maker of Metal Closures

Developments in Collapsible Metal Tube Packaging

by Lester B. Platt

EXECUTIVE SECRETARY, COLLAPSIBLE TUBE MANUFACTURERS COUNCIL

Figure 2. Undercoating being applied to tubes.

The fantastic rate of growth of the drug manufacturing industry has had an immediate influence on all of us in the packaging industry. As the new drugs were mass-produced in their various forms—liquids and powders, pills, capsules, ointments and creams—the metal tube makers suddenly found themselves faced with an ever-increasing demand for their unique container. Not only did the "wonder" drugs demand a greater volume of metal tubes, but frequently their unusual chemical composition necessitated special tube liners to maintain their potency.

The collapsible metal tube industry has been able to come up with the right answers to such new problems presented by the drug industry. Thus the fold-up metal tube has made it possible for the ointment and salve forms of these great new drugs to be mass-distributed efficiently and, since the metal tube is airtight and unbreakable, without contamination of the product.

Today, approximately 200 million tubes, or 20 per cent of the annual production of a billion fold-up metal tubes, are produced for the packaging of medicinal and pharmaceutical items.

Since the first fold-up metal tube was invented back in 1841—114 years ago—our industry has constantly worked at the job of making its products come closer and closer to ideal performance of the packaging jobs that our customers have demanded of them.

We believe that this record of over a century of performance and continuing improvement is one that few industries in America can match. But we are realists enough to know that what is past is but prologue—that only as this long experience is translated into future performance will you want to use fold-up metal tubes.

Figure 1. Some of the drugs available in tubes.

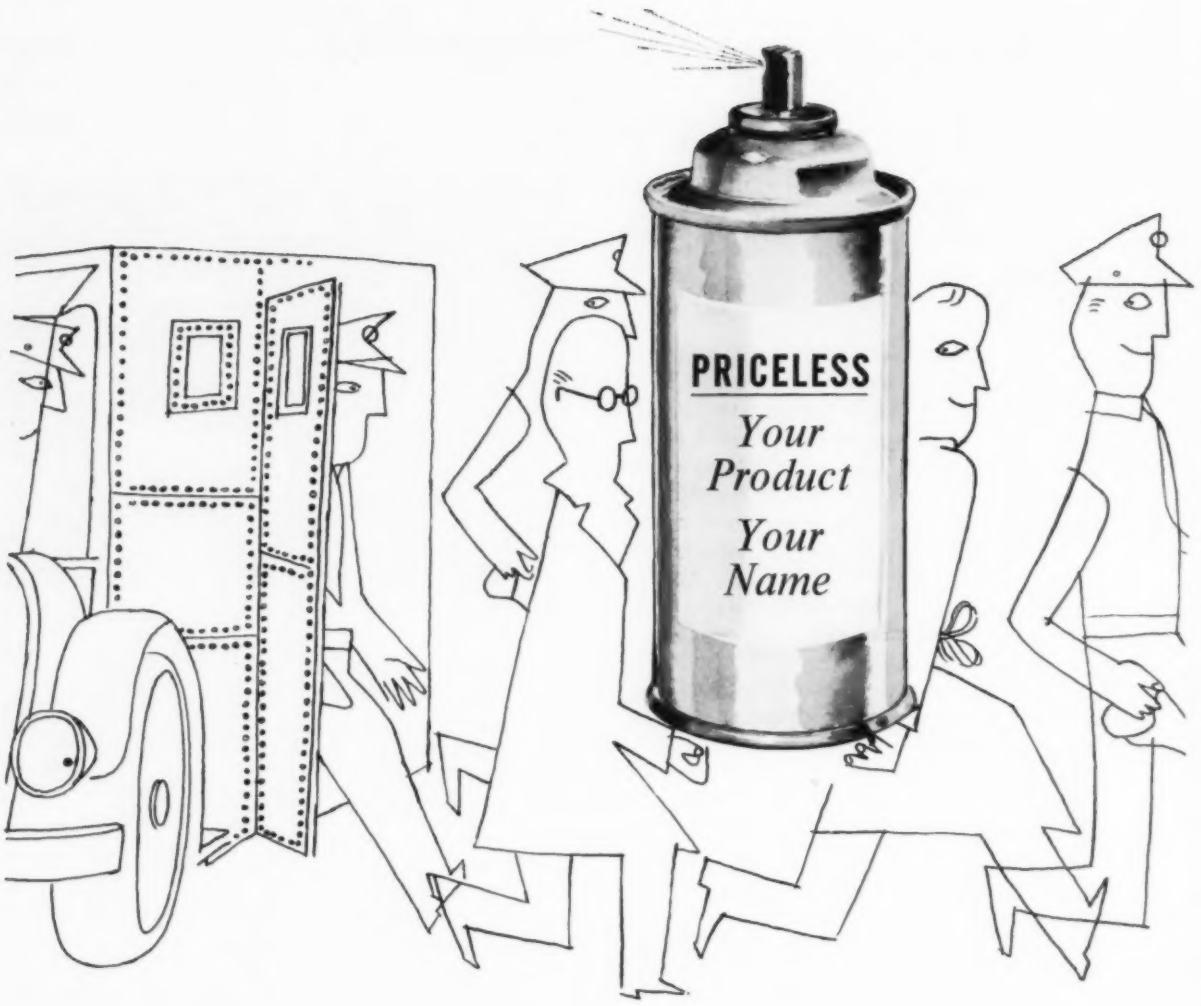
Our industry comprises 16 companies operating 20 plants in 11 states—and most of these companies have been in business for upwards of 35 years. Thus, they offer a wealth of packaging experience and know-how to the tube user.

We have gone through two major technological cycles in our industry. During the first cycle, the tube companies were concerned chiefly with the process of manufacturing tin tubes. Aluminum was unknown for tube use until about 35 years ago, and lead was used only for the packaging of shoe polish, tire patching kits, greases and items of that nature.

The second cycle began shortly after 1920, when three manufacturers who are still active today began the production of aluminum tubes. Since most aluminum research even at that time has been directed toward toughening and hardening aluminum, a complete reversal of effort was demanded to furnish aluminum slugs that were as soft and as uniform as possible for trouble-free extrusion.

In the early days, tool life was very short and problems seemed almost insurmountable, but today every metal tube manufacturer makes aluminum tubes. In

* From a paper delivered at the 17th Annual Forum of the Packaging Institute, October 31 to November 2, 1955.



what value do you place on *your* name?

...To CONN-CHEM, your name is priceless! That's why so many of America's top aerosol brand names are produced by CONN-CHEM. For, "going aerosol" is not just adding another product to your line . . . not just a matter of getting a "low price" from a filler. It's a new horizon that demands handling and controls by aerosol specialists in the unselfish interest of your name.

Here at CONN-CHEM, your project is in the hands of a team of experts who know the problems of the aerosol field, from formulation to market shelf.

So, whether you have a thousand or 10 million cans or bottles to fill . . . whether it's a drug, cosmetic, household, industrial or special product . . . whether you're already in aerosols or considering them . . . put your plans in the hands of the pressure packaging specialists with the longest experience in the industry. It takes a lot of know-how and continual vigilance to keep the quality of your product consistent with your good name! It takes CONN-CHEM!

Talk with our Technical Advisors in complete confidence. No obligation on your part.

CONN-CHEM *for complete aerosol service*
Creative Chemistry . . . Engineering . . . Packaging

CONNECTICUT CHEMICAL RESEARCH CORPORATION, BRIDGEPORT 5, CONN., FOREST 8-2511
Canada: *Connecticut Chemical Canada, Ltd., Curity & Hollinger Rd., Toronto* • England: *Midland Aerosols, Ltd., Wolverhampton*

1954, aluminum production accounted for well over 50 per cent of all collapsible tube volume—in other words over half a billion aluminum tubes were produced and the percentage of aluminum tubes is increasing daily.

In this second cycle, too, began a vast amount of research on tube metallurgy to determine the most effective metal or alloy tube to maintain the potency of the product. Along with this research went intensive experimentation to come up with the best coatings and liners, caps and closures, and enamels and applicator tips.

The size of the tube should be determined carefully by the packager in accordance with the standards of the tube industry, the specific gravity of his product, merchandising considerations and other factors. The ratio of diameter to length should be about one to five; and according to tube standards, the diameters vary by one-eighth inch difference. The size of the neck opening is determined, of course, by the product's consistency and use.

Two shapes of tubes may be chosen—the fat-fill or the V-fill. The most common selection is an in-between shape that combines the well-filled look of the fat-fill and the appearance of greater length provided by the V-fill.

Depending on the purpose and consistency of the product, there are a profusion of tips (figure 4) to dispense them in the best manner. Among them are the blind-end tube for compounds, caulking tip, grease tip, screw-eye tip, small tapered tip, standard neck and blind foil orifice. This last type, which prevents seepage and tampering, can be pierced with the pointed tip of the cap.

A full understanding of how to use metal tubes most effectively calls for some knowledge of how tubes are manufactured. Allow me to summarize it briefly.

Metal for tubes is usually melted from pigs, molded into slabs rolled to proper thickness and cut into slugs of predetermined size. The slugs are fed into presses and are extruded under enormous pressure into tubes, including body, shoulders, shoulder embossing and neck, which must be threaded and trimmed. The tube at this point may or may not have an aperture in the neck.

Tubes to be printed are then coated (figure 2) in one color, and while this undercoating is still tacky, the wording and design are applied. Several colors can be applied—a separate plate being required for each color. Lacquer may be added to further protect the decoration.

If an interior protective coating is necessary, it is applied before the final operation of inspecting and packing. The latter is normally done in partitioned chipboard containers holding part or multiples of a gross lot.

Thus it can be seen that the metal tube manufacturer must have a thorough knowledge of metallurgy, chemistry, the graphic arts, and machine shop practice.

Figure 3. Removing a Ready-Peel Label from a tube.

In common with all industries, the collapsible metal tube industry has faced economic crises caused by fluctuations in the national economy. Fortunately, it is true that we have emerged each time stronger and more hardy then before.

For instance, in 1940, approximately 80 per cent of the volume of the collapsible tube industry was in either tin or aluminum. And then, as you well remember, tin and aluminum went to war! This was like taking steel from the shipbuilder or automobile manufacturer.

To cope with this situation, we designed and built waxing machines to coat the inside of lead tubes with waxes. The Food and Drug Administration was quickly convinced that the lead absorption in these new waxed lead tubes was about nil. So this is how

(Continued on page 842)

Figure 4. Mastitis, intranasal and ophthalmic tips.

NEW! SCHRADER

★ **Designed exclusively for foam**

★ **Rapid pressure filling makes loading easier**

10 Reasons Why PRESFOAM is best for Dispensing

- "Ribbon" pattern dispensing . . . easier to use . . . reduces waste
- Better wiping action—vertical opening designed to fit the hand
- Positive locking
- Positive direction . . . no "flying" foam
- Positive shut-off
- Even flow rate . . . every time!
- No extra cover to replace . . . easy and economical to assemble
- Resistant to corrosion . . . stainless steel and all plastic—no rubber or rubber-like materials
- Attractive appearance . . . various color combinations available
- Schrader-made parts . . . Schrader assembly . . . Schrader 100% inspection . . . Schrader reliability backs each valve

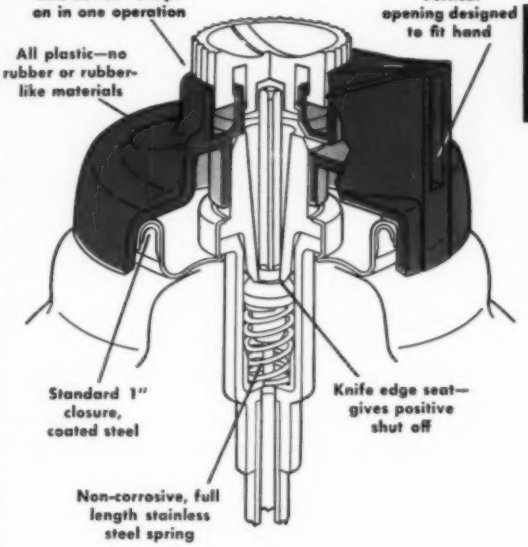
The ideal foam valve is available for your forward planning. Now in the all-new Schrader PRESFOAM Valve you get the answer to today's and tomorrow's competitive foam dispenser problem: *Customer satisfaction.* Here's a valve designed with you and your customer in mind. *For you* it means faster filling since this is a rapid pressure filling valve that'll load fast! It's attractively designed — handsome, all plastic — no rubber — combined with corrosion-resistant stainless steel spring, available in combinations of colors to match your requirements. And what's more — every valve is backed by Schrader's unexcelled research and development facilities. *For your customer,* PRESFOAM means ribbon-pattern foam that's easier to use.

Get set with PRESFOAM — the all new foam valve that's designed exclusively for your foam needs.

Schrader®
ESTABLISHED IN 1844

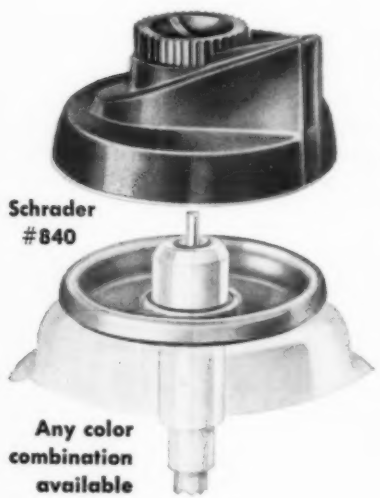
AEROSOL and FOAM VALVES made by
the leading producer of Standard Tire Valves

Presfoam VALVE


Combination dispensing Cap and Button—Snaps on in one operation
Vertical opening designed to fit hand
All plastic—no rubber or rubber-like materials
Standard 1" closure, coated steel
Knife edge seat—gives positive shut off
Non-corrosive, full length stainless steel spring

INSIDE STORY OF PRESFOAM

Take a closer look at this stellar performer. The all-new PRESFOAM offers stainless steel spring and all plastic construction—no rubber components. Button part of dispensing cap—that means no plastic threads to strip. And see, too, a minimum number of parts make up this valve—less chance of failure in use. It's economical for you to use. Remember: the same quality inspection methods you'd expect on any Schrader Product—are used on the new Schrader PRESFOAM Valve.



Schrader #840

Any color combination available

SCHRADER #840 PRESFOAM VALVE—for all foam type dispensing. Supplied in 1" closure with draft tube assembled. When ordering specify make and ounce capacity of can so right draft tube length can be furnished. Dispensing opening ¾" x ¼" vertical. Other openings to meet your specifications. Ribbon pattern. Positive wiping action. Positive direction. Coated steel closure—stainless steel spring and all plastic—no rubber components. Pressure filling type. Available in various colors. Priced competitively. Samples on request. Backed by the good name of Schrader.

MAIL THIS COUPON TODAY

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Division of Scovill Manufacturing Company, Incorporated, Dept. DC
470 Vanderbilt Avenue, Brooklyn 38, N. Y.

I am interested in full information on your PRESFOAM VALVE

Name_____ Title_____

Company_____

Address_____

PLAX Reviews its Progress

C. Paul Fortner, vice-president, research and development, removing lining from experimental bottle. In actual production bottles, lining cannot be separated.

At a press meeting in New York on November 9, Plax Corp. discussed its latest accomplishments in the plastics industry and predicted that the year 1955 would prove to be the time when the plastics field really came of age. Robert F. Elder, executive vice-president, stated that the period since the Korean War was probably the most active for research into new plastics materials and manufacturing techniques.

Reviewing the company's progress, he said one of the most pressing problems in plastic bottles has been that of permeability. Certain products such as cleansing creams, sun tan oils, baby oils and hair tonics have frequently been found to escape through the walls of the plastic containers, resulting in "outer wall greasiness and distortion." In fact, 50 per cent of the products submitted to plax had to be dismissed because of permeation. This permeability will be greatly reduced in the future through the use of newly developed linings which coat the inside of the bottle, forming a container within a container. This is expected to enlarge the field of plastic packaging greatly to include entirely new groups of products like essential oils, emulsions and lubricating oils.

Altogether the company has tested about 40 linings and from these has developed two which are now commercially available. Although the linings are adhered to the outside as a rule in Europe, manufacturers in this country prefer inside linings, feeling they offer better protection and are more durable.

Before deciding on a particular lining, the company makes extensive tests to assure the customer of the finest performance possible. Plax has the mechanical equipment for applying the lining but does not intend to get into the machinery business.

The subject of how to make printing stick to the polyethylene and how to adhere the liners is a very detailed one which has required a tremendous amount of research.

In discussing the newest type of plastics which are now being introduced to the market—variously known as low pressure polyethylenes, "Marlex," "Hyfax," "Ziegler," and "Super Dylan," according to the manufacturer's trade mark—Plax prefers to call these polymethylenes. There are distinct differences between the now-familiar polyethylene squeeze bottles and the new polymethylene bottles.

Polymethylene is unsuitable for squeeze bottles if used in the conventional Boston Round bottle having the same thickness as the polyethylene containers. However, according to Plax, the new plastic can be modified for use in this type of application by the appropriate wall thickness and bottle shape.

Among other differences, polymethylene is opaque, as contrasted to the translucent polyethylene. Furthermore, the Ziegler-type polymethylenes are cloudy, and Plax finds it necessary to add coloring to the material to make it acceptable because so far it is not possible to remove the residual catalyst which is used in producing the plastic. The Phillips-type plastics are clear.

Up to the present time, Plax does not know what effect the catalyst might have on any products which might be packaged in the containers. In fact, the company does not know what effect the color, or pigments, would have either. *(Continued on page 854)*

May the Gifts of Peace
and Happiness be Yours

HAZEL-ATLAS GLASS COMPANY

HOW *glass aerosol* CAN BOOST THE *sales appeal* OF *your products*

Package for spray-dispensing... and do it in glass. This combination gets results! Push-button containers invite immediate attention and examination ... give both men and women shoppers cleanliness, protection, economy. Glass, of course, has always had universal sales appeal. Personal products, especially, like perfume, cologne, sun tan oil, hair dressings, deodorants, etc., sell faster when they're spray-dispensed in glass. Glass aerosols offer high content visibility, shelf promotion of product color, and an unlimited range of inexpensive bottle shapes and sizes... for flexible pricing in highly competitive trades. Capitalize on the trend to glass aerosols now. Boost profits. Contact Continental for a free product evaluation today.

Clear hour-glass bottle.

Frosted hour-glass bottle.

Clear "simplicity" bottle.

Wheaton plastic-coated bottle.

Wheaton clear oval bottle.

CONTINENTAL "EXTRAS"

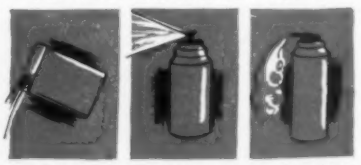
- **Complete Filling Service.** *We do not merchandise any products of our own. Our sole operation is contract and custom filling of containers with your products ... liquid, pressurized or aerosol... in glass or cans.*
- **Extensive Laboratory and Production Facilities.** *Continental conducts chemical analysis and continuing research on dispensing methods and containers. Filling equipment is the finest in the industry, geared to handle orders of any size. Quality control and inspection safeguard your shipments.*
- **Warehousing and Drop Shipping in Bulk Lots.** *Extensive storage space lets you use our two centrally-located plants as national distribution points with consequent savings on freight. We handle shipping and paper work. Orders go through on schedule.*

MAIN OFFICE • 123 NORTH HAZEL STREET, DANVILLE, ILLINOIS

CONTINENTAL FILLING CORPORATION

PLANTS • DANVILLE, ILLINOIS — HOBART, INDIANA

CONTRACT AND CUSTOM FILLING



LIQUID SPRAY FOAM

Packaging and Selling

Are Retailers Abdicating?

The printed word, the voice by radio and the visual and auditory salesmanship of television is taking over more and more of America's selling. This is becoming progressively true of every kind of branded product, including some industrial goods and certainly such products as the automobile and household utilities, where up to recently personal selling at the point of sale played the most prominent part in the sales finalizing of these goods.

This transfer of the primary sales influence from the point of sale to the producers' advertising is evident in this period of chaos and change in the automobile industry. Today mass advertising of the automobile has established such a clearcut sense of value in the mind of the consumer that the small franchised retailer appears to be passing out of the picture. Today automobile sales are moving over to the large centralized retailer who is working just like an automobile super-market or a discount house.

But it is substantially in the package field, where distribution is through the retail store, that this change in the place of the primary sales influence is most noticeable. Almost universally, today, the retailer seems to be abdicating his place as an independent link in the chain of distribution and seems to be content with a passive position where he furnishes simply a warehouse convenient to the consumer and in this warehouse a visual display.

That this may be a huge step forward in achieving greater economy in distribution would appear to be obvious, so far as such retailers as the grocery super market, the variety store and the run of the mill of other retailers go. But for the retailer who has acquired a heavy overhead of selling expenses either because of his centralized location or because of his unusual services or because of his position in such things as fashion and prestige this desire to completely relax and coast on the sales effort of the manufacturer is highly questionable.

In this industry, except for ethical products, a distribution problem is in the making because of the varied kind of retailers which the industry sells and the substantial disparity in the cost of doing business of these different retailers. In the cosmetic business today, we have many companies such as Revlon, Rubinstein, Coty, Yardley and others who are making use of mass advertising, which requires for its support mass consumption and mass distribution, but who are still, through the potency of this advertising, holding their position in each branch of the trade, that is in the class fashion stores as well as in mass stores.

It seems to us well within the range of good economics and a favorable competitive position for the grocery super market, whose operating cost is about 18 per cent to eliminate such things as personal selling, such customer services as credited and delivery and such expensive operations as style and fashion. This kind of operation can safely, from a competitive viewpoint, allow the manufacturer to do practically all of the selling to the consumer while they concentrate simply on availability and convenience in distribution.

It would appear, however, that there must be a loud note of warning to such retailers as the department store in this situation. It is only by the grace of fair trade that the 40 per cent markup, which the department store must have to exist, has continued under these circumstances. The 40 per cent markup, so far as packaged retail goods go, was devised for the day when the retailer incurred heavy expense because of his initiative in selling and servicing consumers. Without these services and selling activities, there is no more reason why this costly markup should continue in this industry, and for retail package goods, than it is continuing, for instance, in the automobile and the household utility business, where under the counter retail cuts, price subterfuges in trade allowances and the discount house is making a mockery of the traditional discount.

It seems to us that the retailers who will continue under the 40 per cent markup must be those who are contributing a very definite plus function in distribution, that is, in active selling at the point of sale. It may be even that they must resist the sale of products which have established a mass market no matter what this may mean to the store in lost temporary dollars. At least it must be true that the retailer of the future cannot completely have his cake and eat it; that is he cannot retain his 40 per cent based upon an active part in selling and servicing the public and at the same time abdicate and turn over to the manufacturer all selling operations except the mechanical ones of display and convenience.

Helping Cosmetic Sales

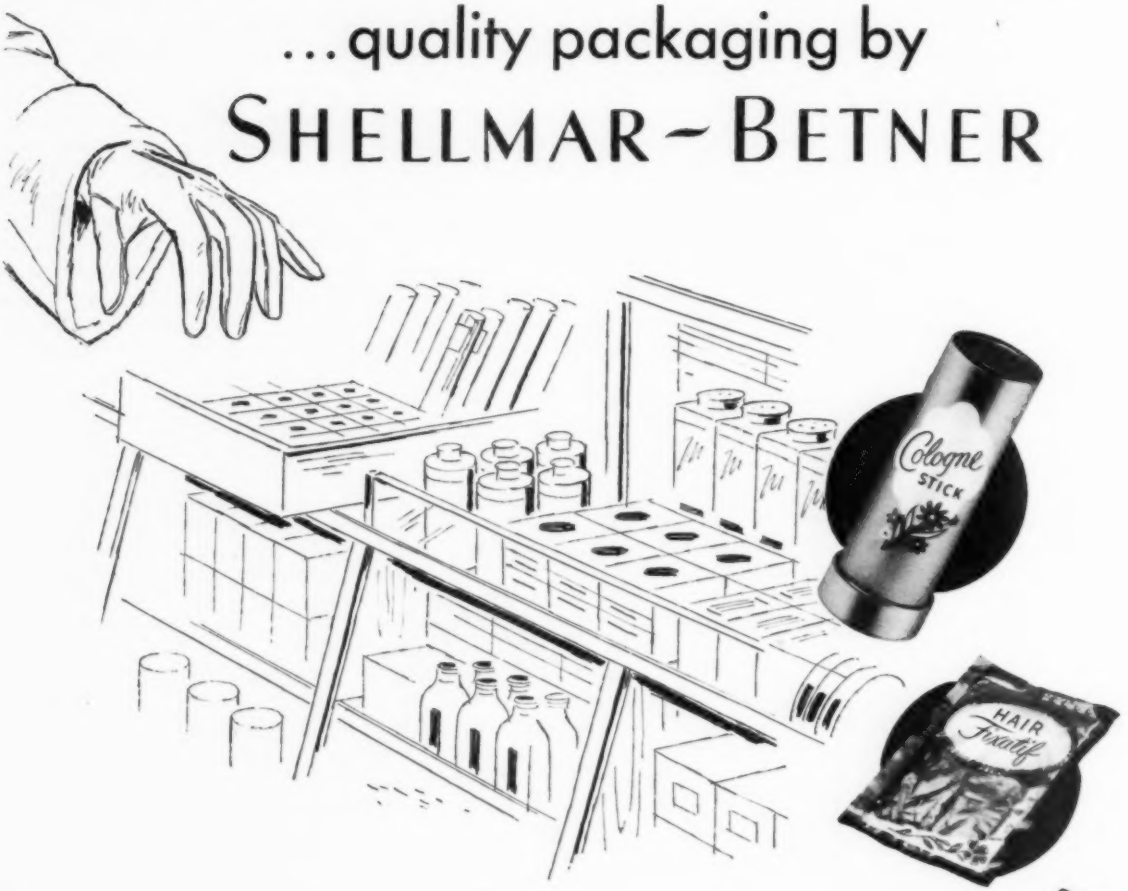
One of the big, coming campaigns of next year, we hear, is large space national advertising to promote the idea of taking the family out to dinner. This campaign will be conducted by the National Restaurant Association, together with the support of a number of suppliers such as General Foods, Heinz, Kraft, Standard Brands, International Silver and others.

We remember a strikingly vivid series of full-page newspaper advertising run by Macy's last year, in which they featured a leading moving picture popular at the time. Facing this page was another Macy advertisement featuring apparel for an evening out.

Macy's theory was that stay-at-homes, either reading or looking at television or listening to the radio, were

Beautifies! Protects! Sells!

...quality packaging by SHELLMAR-BETNER



With so many exciting products to choose from, does your customer reach for your brand? She does, if it's attractively packaged, if she knows that your product will stay fresh and keep its high potency value. A package by Shellmar-Betner gives her that assurance.

At Shellmar-Betner we've had years of experience in drug and cosmetic merchandising, package design and quality printing. Our designers work with foil, acetate, polyethylene, vinyl—in fact, every type of flexible lamination. They are skilled in flexographic and gravure printing, too. And the tougher the job, the better they like it.

So remember the name, Shellmar-Betner. Call us to talk over your packaging problems.

Our Fiftieth Year of Tailor-Made Packaging

CONTINENTAL CAN COMPANY

SHELLMAR-BETNER

FLEXIBLE PACKAGING DIVISION

MT. VERNON, OHIO

Sales Offices in Principal Cities

not spending their normal amount of income on apparel.

The same thing could certainly be said of cosmetics and perfume. Now the restaurant folks are in the pitch to get people out of the home. This should have a good influence on our industry.

Near Sighted

Here's something for package designers. A recent survey of women shoppers discovered that about one woman in every three should have been wearing glasses at the time she was shopping. Either for reasons of pride or for some other reason these women had left their glasses home. Thirty per cent near-sightedness is a factor in package design that is not often mentioned.

Competition

We seem to have the impression that the Justice Department is moving into a much narrower interpretation of anti-trust charges. A little while ago the Department considered a merger in the pharmaceutical industry on the basis of whether it would create a monopoly in one class of product, rather than on whether the combined companies were affecting competition within the entire industry.

Now the Justice Department has filed a civil suit against the Safeway Stores, charging them with attempt to monopolize the retail grocery business in cities in Texas and New Mexico. The new theme of the department seems to be competition in any of its parts, as well as in the entirety.

This Expanding Industry

Just a memo to show how diversified the pharmaceutical industry is becoming. It is reported that King Salmon and Halibut, caught off the State of Washington, have been shipped east on only one re-icing for the six-day ride. The reason—the ice contains five parts per million of Aureomycin Chlortetracycline.

Private Label

A quick glance at the business papers in the food industry gives the impression that there is a growing amount of backstage and worried discussion over the growth of private label brands in some of the leading food chains.

According to reports the food chain private label business is very much on the upgrade both in the number of products coming under the private label and in the increasing percentage of business which they are getting in their particular product field.

This private label growth is coming at the particular time when manufacturers are dumping more money into consumer advertising than they ever have before. It is coming at a time when manufacturers have discovered and are using in a big way the most potent force we have ever had in advertising, that is, television. It is also coming at a time when many manufacturers have been led to believe that through television and enormous capital expenditure for advertising they could at last so influence the customer saleswise that they could dictate to the retailer pretty much as they pleased.

Apparently, the manufacturers have not been reckoning with two conditions which are emerging at this time. One is the really enormous growth in what is called "brand disloyalty" of the consumer, that is, the consumer's unwillingness to stoop or bend or move a few paces in any direction for any brand. The other condition is that retailers are discovering that it is they who can really control the consumer's purchasing, in their own store, at the point of sale, no matter how much a manufacturer spends on advertising.

Most of the private label products of the food stores have been on basic staples, where it has been difficult for the manufacturer in their advertising to register any very definite quality or product variation. At the same time the retailer has discovered that he can pretty well control the sale of any product by controlling the shelf position.

Of course, it all comes down to a question of dollars and cents in the retail profit margin. This may means that the retailer is on his way to setting a definite limitation on how far the manufacturer can go in reducing the retail discount and so in this way indirectly controlling or influencing the amount of money that can be spent on national advertising.

Advertising and Research

Does modern advertising increase, decrease or have any effect of any kind on research? This it seems to us, is an interesting question because there can be very little doubt but that advertising, as we know it today, will have some effect on research.

Today's advertising is a far different and a far more potent force in many ways than the advertising of 20 years ago. We have today added to our means of communication both radio and television, but even more, we have added a new element and that is the element of time.

When a new packaged product is put on the market with some advantage, slight or otherwise, over its entire competitive field, which gives it a strong news element, the new advertising technique is a highly developed process of spending a million or more dollars within a comparatively few weeks. This technique of getting there first with the most dollars and smothering competition is the most notable achievement developed by the advertising of today.

It would seem that the ability to strike rapidly with crushing force would be an enormous stimulus to research. This means research as a defensive measure, to keep from being exposed to these crushing blows, as well as research to come up with something new and something different which will warrant the expenditure of so large a sum.

It is probably true that this positive effect on research has been operating for the huge, major companies. For the little company, however, advertising can hardly be an incentive to further research. It may, in fact, mean that the little company could come up

with some new technical development, for which there is no adequate protection from competition, and this would only lead toward their being further smothered. It is also true that the result of this massive pressure of advertising on the public has brought such notable results from so many gimmicks that a great deal of research time has been applied to gimmicks as something that will bring quicker response than with the fundamental research.

It would not take too much study of the recent advertising in such industries as liquor, cosmetic and packaged-processed food products to arrive at the conclusion that the chief effect of advertising on research has been to stimulate a bewildering and discouraging and sometimes nauseating variety of gimmicks from a chemical viewpoint, a packaging viewpoint and a premium or coupon promotion viewpoint.

Cosmetic Consumption

In certain parts of the cosmetic industry, there are indications that a detailed study of cosmetic consumption is under way. The reason for these detailed studies is that it is becoming perfectly obvious that the balance between products or classes of products in this industry is being seriously upset. Certain cosmetic products are showing dynamic growth both in the number of people using that cosmetic and in the frequency of use. Others are somewhat more static in each of these classifications and still others, such as face creams, are showing a substantial declining market both in the number of women who are using face creams and in the frequency with which those still using the creams are applying them.

The cosmetic industry has had one phase of consumption which is typically true of the American market, which has accounted for a great deal of cosmetic production and which also may be threatened. This factor is obsolescence or the throwing away of the cosmetic by the consumer before it has been used up. One of the factors causing obsolescence in our trade has been the package. For instance, in such things as a lipstick this cosmetic product has been thrown away while a fraction of the stick still remains intact because of a practical inability to use it down to the last particle. This is somewhat along the line of the cigar or cigarette which is discarded while 20 per cent or more of the product is still intact. Another factor in obsolescence has been in the product itself.

This has not affected many cosmetics. This is a fault inherent in formulation, which the manufacturer has not been able to overcome. It consists of such things as evaporation which adversely affects the quality of such things as perfume and nail enamel.

But by far the major factor in obsolescence has been a deliberately planned factor employing color, style, and fashion, special promotions and special gift packages. By means of a continually changing form of presentation, the American woman has been strongly tempted day by day and particularly season by season to purchase something new and intriguing which would perform in the same way and with the same function of products which she already possesses and which are partly used.

It is this last factor of deliberately planned obsolescence which may be threatened, to a certain extent, in the cosmetic industry today. The dominant trend of this industry is toward the low or medium priced specialty, mass advertised and mass-distributed. To meet the requirements of mass distribution and mass advertising, a cosmetic product must more and more move over into a product classification that may be defined as (1) Truly functional in its use; (2) A pickup convenience for retail display purposes; (3) A mass market price.

These are things that tend to lessen or even eliminate, as has largely happened in such products as deodorants and shampoos, such things as style, fashion, glamour and gift.

A leading advertising agency man recently noted that "consumption does not necessarily mean wearing out goods in a physical sense. In this country, we wear out goods psychologically as well." This is basically true and it is what we mean by the enormous importance of such things as fashion and glamour in the cosmetic industry. If the cosmetic industry is to continually lose consumers and lose ground in frequency of use in some of its product classifications, it will certainly be because the growing tendency to specialization, to mass advertising and to mass distribution has too brutally functionalized a product and taken it completely out of any hope of fashion appeal.

Package Trance

According to a leading public relations specialist, packaging is so exciting today that in grocery stores it is causing what is known as "Super-market Trance." We quote further "Add to this the colorful display of cartons and the smartly designed counters and trays and the modern super market is an exciting, stimulating spot. In fact, recent studies have established that the average shopper is actually in a state of trance. Her entire rate of awareness is lowered. She is hypnotized by the effects of mass display, lights, signs, slogans, pictures, colors, trade-marks, etc."

This is very alarming to us. We foresee the day when Mamma, in a trance, is going to pick up a jar of face cream instead of a jar of mayonnaise and then what will our salad taste like that night?

Let's Hope Not

Much of the research and developments in animal health and animal treatment over the last ten or fifteen years has been associated with, or has been a by-product of the research in human health. But just to show what might happen to us if the time comes when we occasionally reverse this process and find in animal research a product for human beings is shown recently in an advertisement which appeared in a small Lancaster, Pennsylvania farm journal.

We quote from this ad with fear and trembling:

"Breeders of livestock and poultry are having better results by using Lancaster Breeders Oil."

J. M. S., Penna. dairyman, writes: . . . "Had seven cows that would not breed. I drenched (each) with

DESIGNS FOR

FAST DELIVERY

When you want standard shape plastic bottles *fast* — come to Continental. Our Millsplastic Division carries a large inventory of standard sizes in four popular shapes. Natural polyethylene bottles can be shipped at once, and the same molds can be used for translucent or opaque colors. Yes, Continental has the plastic bottle you need. For fast shipment call us.

Our Fiftieth Year of Tailor-Made Packaging

CONTINENTAL CAN COMPANY

MILLSPLASTIC DIVISION

135 SOUTH LA SALLE STREET · CHICAGO 3, ILLINOIS

she shall have

BEAUTY

wherever she goes

You can promise yourself more repeat sales when you package your compressed powder and rouge in *Scovill's patented refillable vanities.* Women return for refills time and time again. Why lose this profitable refill business? Talk to a Scovill representative about richer-looking, distinctive vanities styled to meet your requirements.

Scovill Manufacturing Co.,
Drug and Cosmetic Container Division,
63 Mill Street, Waterbury, Conn.

4 oz. Lancaster Breeders Oil . . . less than 2 weeks all were in heat . . . veternarian tells me all but one have calf."

Fashions for Future

Commenting on developments in synthetic fibres, the New York Times recently ran this little jingle:

In "55 what will ladies wear?
Chiefly natural gas, salt and air.

P.S. We'd like to add:
Let's hope we're there.

Suburban Growth

Here's an interesting figure to show how the suburban market is growing. According to new reports from the Census Bureau, the rate of population growth in the outlying parts of 168 standard metropolitan areas covered by the census has been 27.8 per cent in the last five years, or seven times as rapid as the population growth within the central cities. This rate of growth was 3.8 per cent.

Diversification

One of the most prevailing styles or fashions in business thinking today is that diversification is an essential for business growth and future security. This feverish race for diversification has brought some mighty curious weddings. The one which in our opinion takes the cake up to date is the Adam Hat new venture into bottling and distribution abroad for Canada Dry Beverages. We think a lot of the mergers consummated simply for the purpose of so-called diversification are in for future trouble. If a merger brings in a new company not related to the present one, with different problems, different ways of doing business and different ways of thinking, we think diversification is the multiplication of trouble rather than the simplification of troubles.

The Second Cup

The principal thing that we like about all these motivation researches which are going on in advertising and sales circles is the fact that the motivational research people usually seem to come up with something completely soul-satisfying to the people who are shoveling out the dough.

We read a report recently regarding the research of the coffee people who employed one of these groups of associated psychologists, psycho-analysts, anthropologists and Freudians for the declared purpose "to learn people's deep-seated feelings about coffee."

It must be admitted that there should have been an element of speculation in the expenditure of a considerable sum of money to find out what people really thought about coffee or for that matter about anything else. However, much to the amazement of the coffee people the deep-seated feelings of the consumers, according to motivational research, revealed that the cup of coffee most enjoyed by people unanimously was the second cup of coffee. According to this report "people associated feelings of well-being, relaxation and contentment with coffee and this is particularly true with the second cup."

Our feeling is that there is absolutely no limit for the market on motivation research. It might even be possible, that if the coffee people will double their appropriation for motivational research and probe even a little deeper that the research company might even come up with findings which prove that the third cup of coffee will give you a feeling of ecstasy.

Forgetfulness

Probably the biggest single problem that has always vexed advertising is human forgetfulness. Today, with more than 50,000 current, alive trademark names in just this one industry, (that is, the equivalent to asking anyone to learn to read fluently a minimum of twelve different foreign languages) forgetfulness becomes a colossal problem for advertising men.

No matter how much money is spent in advertising, or how many kinds of media are used, or no matter how much penetration in depth or in any other direction the advertising achieves, the American public cannot possibly remember more than a small fractional percentage of the brand names now actively displayed for sale in this country.

It is also true that hardly any retail sales clerk has the mental capacity or the ability to recall more than half of the brand names carried in their department. Memory is a very peculiar thing which the psychologists are not too sure about. For a long time, it was thought that time was the essence in this mental quality. But a leading psychologist recently found out that forgetting is not due merely to the lapse of time, that is an impression on the nervous system would naturally fade out over a period of time. Laboratory experiments have shown that the rate of forgetting during a time period is more dependent upon what is going on during that time period rather than to the period of time itself.

This looks as if it makes it even worse for the advertising business than we thought. Here in America, we are crowding so many impressions within any given time interval that the mind even falters at the thought of measuring or counting them.

What all this leads up to is that it takes a lot more than a million dollars each year to make even a faintly visible impression upon the mind and the memory of the American consumer. It also means, to our way of thinking, that the future development in selling is not necessarily going to mean more or even better advertising, but very definitely better selling in cooperation with the retailer.

When both the manufacturer and the retailer recognize that for all except a few somewhat favored brands, almost every sale is made or lost at the point of sale then perhaps the big advertisers and the big agencies, who are today thinking almost exclusively in terms of clubbing the retailer with massive advertising programs, will begin to do some more constructive thinking on the vital importance of what takes place inside the retail store.

What the consumer had to say aerosols would fill a book, and

Which type of room deodorant is preferred?

Get the answers to this and other questions on household product preferences. New Du Pont survey tells what the housewife looks for in an aerosol product.

What kind of personal deodorants are purchased?

Cream, stick, squeeze bottle or aerosol—the Du Pont survey has the facts on consumer purchases. Find out what the consumer buys, why and where she buys it.

Why best-selling aerosols use Du Pont "Freon"* propellents

Ever since the original "bug bomb," Du Pont "Freon" has been the best propellent for best-selling aerosols. Today, "Freon" propellents are the most widely used of all aerosol propellents. The reasons are simple—quality, purity, safety and service. No one is better able to supply just the right aerosol propellents than Du Pont—manufacturer of "Freon".

Quality and purity are assured by Du Pont's nearly 25 years' experience manufacturing "Freon" to strict laboratory standards. "Freon" propellents are safe because they are nonflammable, nonexplosive and virtually nontoxic. Du Pont has served the aerosol industry since it started with laboratory assistance and market surveys like the new 1955 consumer aerosol survey.

If you're in the aerosol business or plan to be, take advantage of Du Pont's vast background of experience and intimate knowledge of all phases of aerosols. Take advantage, too, of Du Pont's ability to supply just the right combination of one or more "Freon" propellents best suited to your aerosol product.

For more information or technical assistance, mail the coupon or write to E. I. du Pont de Nemours & Co. (Inc.), "Kinetic" Chemicals Division, Wilmington 98, Delaware.

about it did...

A Marketing Service from Du Pont
inside the consumer
AEROSOL MARKET
1955 survey of consumer knowledge, use and opinion of aerosol-packaged products.

Does the dispenser affect hair-spray use?

How well do consumers like aerosols for hair sprays and other personal products? New survey gives you the facts to rate and improve acceptance of your product.

HERE'S SALES-BUILDING HELP FOR YOU

• Du Pont's new survey outlines the buying pattern for a variety of household and personal products. Preferences and buying habits, likes and dislikes . . . here's everything you need for your aerosol marketing plans. Send in the coupon below and get the facts about today's consumer aerosol market.

MAIL THIS COUPON TODAY FOR FREE CONSUMER AEROSOL MARKET SURVEY

KINETIC

FREON
SAFE PROPELLENTS

"Freon" is Du Pont's registered trade-mark for its fluorinated hydrocarbon propellents

DU PONT
REG. U. S. PAT. OFF.

Better Things for Better Living . . . through Chemistry

E. I. du Pont de Nemours & Co. (Inc.)
2420—13 Nemours Building, Wilmington 98, Delaware

☐ Please send your new 1955 market survey "Inside the Consumer Aerosol Market".
☐ I want to learn how I can get technical assistance on aerosols.

*Name*_____ *Position*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

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NEWS IN PACKAGING...

Forms Aerosol Techniques

H. R. Shepherd, as founder and president of the newly formed Aerosol Techniques, Inc., has announced the following officers of the company: Walter Feldesman, vice-president and general counsel; Nobart G. Smith, director of manufacturing and research; Dr. Peter Sgaramella, chief chemist; Donald MacMurray, district sales manager; Mrs. Ethel Walsh, sales service manager and administrative assistant to the president; and Harold Westheimer, auditor.

H. R. SHEPHERD

Mr. Feldesman has had an outstanding career in the Judge Advocate General's office of the U. S. Army. He is on the board of directors and is general counsel for several large corporations.

Mr. Smith has been associated with Admiracion Laboratories, a division of Nopco Chemical Co. as production manager and also, until recently, as chief chemist at Connecticut Chemical Research Corp.

Mr. MacMurray had formerly been associated with Warner-Hudnut and Helena Rubinstein, respectively, particularly in their purchasing departments.

Mrs. Walsh was until recently connected with Propel Chemicals, Inc.

Mr. Shepherd was co-founder and formerly vice-president of Connecticut Chemical Research Corp., and before that a member of Bridgeport Brass Co.

The production facilities and the three entirely separate research laboratories of Aerosol Techniques have been designed for each of the company's product division—one for cosmetics, another for pharmaceuticals, and the third is for the application of aerosol techniques to industrial chemicals and chemical specialties.

Packaging Inst. Elections

Herbert T. Holbrook, vice-president in charge of expansion and development, Standard Packing Corp., was elected president of the Packing Institute at the 17th Annual Forum on October 31 in New York. He succeeds

HERBERT T. HOLBROOK

F. S. Leinbach, Riegel Paper Corp. E. H. Balkema, Colgate-Palmolive Co., was re-elected vice-president; A. Douglas Murphy, Esso Standard Oil Co., became vice-president and treasurer; Charles W. Kaufman, Kraft Foods Co., was elected vice-president; and Chas. A. Feld was returned to office as executive director.

The following were elected as directors: E. H. Balkema; W. B. Bronander, Jr., Scandia Manufacturing Co.; W. E. Coughlin, Pneumatic Scale Corp., Ltd.; R. J. Dahl, E. R. Squibb & Sons; Walter F. Daley, the New Haven Board & Carton Co.; E. E. Dival, Corn Products Refining Co.; D. R. Grant, Beech-Nut Packing Co.; Frank Greenwall, National Starch Products, Inc.; Herbert T. Holbrook; Charles W. Kaufman; John W. LaRocque, American Flange & Mfg. Co.; Harold Mosedale, Jr., Package Machinery Co.; A. Douglas Murphy; S. E. Noble, Chattanooga Medicine Co.; C. F. Schokmiller, Grove Laboratories, Inc.; R. M. Shultz, National Biscuit Co.; T. A. Torrence, Aluminum Co. of America; and Roger V. Wilson, Continental Can Co.

Peterson Filling in Production

The recently organized Peterson Filling and Packaging Co., Danville, Ill., is now in production and is doing contract and custom filling and packaging all types of containers, specializing in aerosols.

Harry E. Peterson, formerly president, and his brother, Robert J. Peterson, formerly sales manager, of Continental Filling Corp., are now president and vice-president, respectively, of Peterson Filling and Packaging Co.

Edward C. Hegeler is secretary, and Julius W. Hegeler has become treasurer.

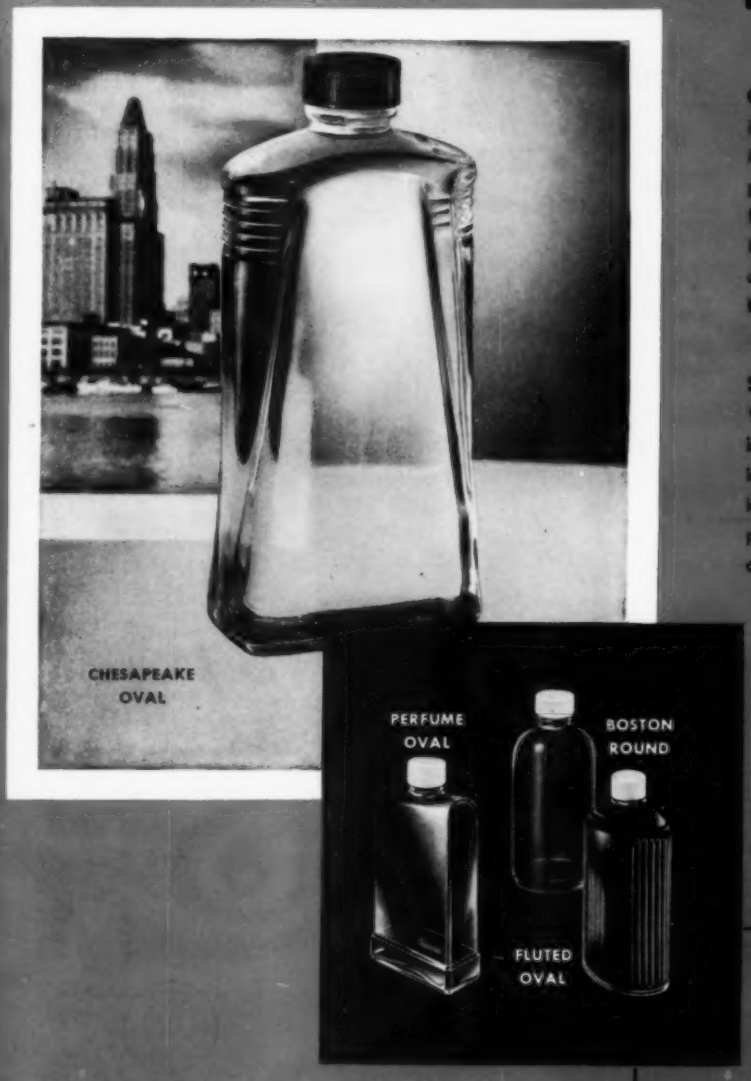
John K. Shea, on the sales staff, and Montefort A. Johnsen, director of research, had also been with Continental before joining Peterson Filling.

New Design for Courtley Packages

The Courtley Company division of Lee Limited, Beverly Hills, Calif., has packaged its toiletry products for men in a family of cartons which are so constructed as to lock into position without the use of glue. The side panels slant inward to give the cartons a distinctive shape.

Courtley Company's toiletry products for men in new family package design.

M Styled for Sales Stocked for Service



Gleaming, crystal-clear bottles in many eye-catching designs—that's Maryland Glass styling! (Or, if you prefer, we will design a distinctive shape for your use.) And these Maryland Glass bottles are *practical* . . . sturdily constructed to fill and pack easily, keep breakage to a minimum.

Stocked for service?
We have a complete range of sizes in all styles, ready to fill your order immediately. Tell us about your product in the coupon below and we'll send prices and samples. No obligation, of course.

Pack to attract in Maryland Glass

Mail this coupon for details, prices and samples

MARYLAND GLASS CORPORATION
2147-53 Wicomico Street
Baltimore 30, Maryland

Gentlemen:

We pack ..... in .....
(type of product) (glass or glass)

Please send us appropriate samples and prices in clear glass bottles.

Name .....

Company .....

Address .....

City ..... Zone .... State .....

Cross Swing Sifters

SALES PACKAGES

Cross Swing Sifters — today's modern container — affords your package an all-round versatility which makes it stand out in competition and step out with greater sales.

Cross Swing Sifters are being used for cosmetics, foods, drugs, pharmaceuticals or any other product that can be dispensed through a shaker or sifter . . . Can we serve you?

MINIATURES

Now available with NEW plastic plug bottoms for easier filling. Cross round miniatures, an exact replica of your full size container, provides the answer for the perfect sample package. Both full size and samplers can be filled with any standard filling equipment. Ask for a representative to call, or write for details and samples.

CROSS PAPER PRODUCTS CORP.

4377 Bronx Boulevard New York 66, New York

CREATORS • MANUFACTURERS OF INDIVIDUALIZED ROUND AND OVAL PACKAGES

in size and shape which permit the packaging of several different products.

The cartons were designed by the Los Angeles carton division of Robert Gair Co., and they were made by the firm's ACM division.

Glass Container Record for Year

Glass container shipments for 1955 will total 134,000,000 gross, according to an estimate by C. C. Merrifield, vice-president of the Econometric Institute, Inc., an independent economic consulting organization. In his address before 150 members of the Glass Container Manufacturers Institute at the Hotel Fontainebleau, Miami Beach, Mr. Merrifield stated ths is an increase of seven per cent over 1954 shipments, and a five per cent increase over the previous all-time high of 127,516,000 gross in 1953.

New Vick Product and Package

Vick Chemical Co. is now distributing nationally a new antibiotic, antihistaminic nasal spray, called, Vicks Medi-Mist Nasal Spray. The company has designed an exclusive clinic-style plastic atomizer for applying the spray. This bottle is offered in a showcase package with a transparent plastic sleeve.

Vick's Atomizer Package

An Improved Celon Seal

The Celon Co. has incorporated a new development in its Celon Seals for glass packages. It consists of a tear strip, outlined by parallel rows of perforations, which permits the consumer to break the seal in a circle where the skirt of the screw cap and glass meet. With a pull on a raised tab, the strip rips off, leaving the cap or cork free for immediate removal.

This is an improvement over the former Cellulose Seal which was often completely removed from the bottle when the consumer opened the package. Now, the Celon Seal will remain on the neck of the bottle, permitting decorations or sales slogans on the lower portion of the Celon to remain intact.

Will License Kemt in U. S.

The Ferster Corp. of Switzerland is interested in licensing Kemt, a hair preparation, and a special "Vaporizer" for manufacture in the United States. Made of plastic and fitted with a system of tubes, the vaporizer, a product of Swiss craftsmanship, sprays a fine, homogenous film of Kemt evenly over the hair in a few seconds.

Kemt is considered a quality product in Europe, according to Ferster, where it retails for less than 50 cents, while the

The Kemt Vaporizer

vaporizer sells for less than 25 cents. Only one vaporizer is purchased and is used with each refill bottle of Kemt.

The product was introduced in Switzerland in 1946 and has since entered other countries, including Belgium, Holand, Germany, Sweden, Denmark, Portugall and Italy.

Additional information and samples of the product may be obtained from Ralph Vierno, 66 Taillon Terr., Closter, N. J.

Recent New Products

Antoine de Paris. A new line of men's toiletries, called *For Gentlemen*, containing six-ounce bottles of cologne and after-shave lotion.

Bourjois. Has completely redesigned its *Evening in Paris* "Satin Finish" Compact and has begun to ship the new package to all retail accounts. Compact is made of white pearlescent plastic with a nylon hinge and unbreakable catch. Metallic blue Eiffel Towers and stars are dye stamped in a circular design on the cover.

Bryant Pharmaceutical Corp. *Reserpine Elixir*, a palatable and easy-to-take preparation for the treatment of hypertension and for use as a sedative in ameliorating tension states.

Donlyv-Evans & Co. *Lipo-Triazine*, a triple sulfa, and *Lipo-Diazine* containing sulfadizine, two new liquid sulfa preparations requiring only twice-a-day dosage.

Norwich Pharmacal Co. Releasing *Unguentine with Dianestol* in five attractively designed new packages as an antiseptic first-aid dressing. The product relieves pain fast, provides long-lasting protection against infection; promotes healing, and prevents gauze from sticking to the injury.

Chas. Pfizer & Co., Inc. *Tetrabon SF*, consisting of tetracycline with B complex vitamins and vitamins C and K, for the treatment of infections caused by a wide variety of gram-positive and gram-negative bacteria. *Crystalline Reserpine 10 per cent Trituration with Lactose*, a new, higher-potency blend of reserpine for the treatment of hypertension and mental illness.

Pfizer Laboratories announces that *Bonamine* has been approved by the Food and Drug Administration for over-the counter sale.

A. H. Robins Co. *Pabalate—HC tablets*, for the treatment of rheumatoid arthritis and its variants.

J. B. Roerig & Co. *Coryban-Vilerra*, a packaged combination of the new cold relief agent, *Coryban*, and the multivitamin and mineral preparation, *Vilerra*.

Roger & Gallet. *Lip Ade with Silicones*.

Schering Corp. *Sigmagen*, for the treatment of mild cases of rheumatoid arthritis and other conditions. *Meticortelone Capsules*, for the present to be used only for rheumatoid arthritis.

Simonetta Inc. *Incanto Cologne*, a Christmas gift suggestion, packaged in a bottle that looks like a Roman column.

The Upjohn Co. *Gordex Tablets*, for moderate cases of rheumatic diseases.

Winthrop Laboratores. *Becejex*, as new ready-to-use, stable solution for treating vitamin B and C deficiency.

control's the thing...

WITH ANCHOR HOCKING, TOO

It's steady *control* that rolls the ball in the 1-3 pocket time after time, picks up all the wood on tough spares. And *control* is important, too, in the manufacture of Anchor Hocking quality products.

From the selection of all raw materials to the final production line inspection, Anchor Hocking employs literally hundreds of exacting *controls,* tests and checks involving many scientific testing devices. Although each factory maintains a laboratory of its own for quality control purposes, central laboratories at Lancaster, Ohio, serve as a control center for all—veritable watchdogs that make certain that Anchor Hocking products comply with their rigid specifications.

Eleven strategically located factories and sales-service representatives in 25 principal cities in the U. S. and Canada await the opportunity to serve you with controlled high quality Anchor Hocking products.

Anchorglass® Containers are uniformly strong, tough, dependable—high in chemical durability, accurate in dimensions, capacity and finish . . . a result of exacting quality controls.

50th Anniversary

Exacting control and timing of glass container forming machines by highly skilled operators result in accurate and uniform Anchorglass Containers.

Samples of all incoming raw materials are analyzed for chemical purity. They must meet rigid Anchorglass quality specifications before acceptance for production.

Every hour samples are removed from annealing lehrs and examined for temper on polariscopes to maintain uniform strength in Anchorglass Containers.

ANCHOR HOCKING GLASS CORPORATION

GENERAL OFFICES — LANCASTER, OHIO

Anchorglass Containers, Anchor Metal and Plastic Closures, Anchor Sealing Machines, Cartons and Package Engineering Service... for Packers, Manufacturers, Bottlers of Foods, Drugs, Household Chemicals, Cosmetics, Toiletries, Beverages, Beers, Ales, Wines and Liquors.

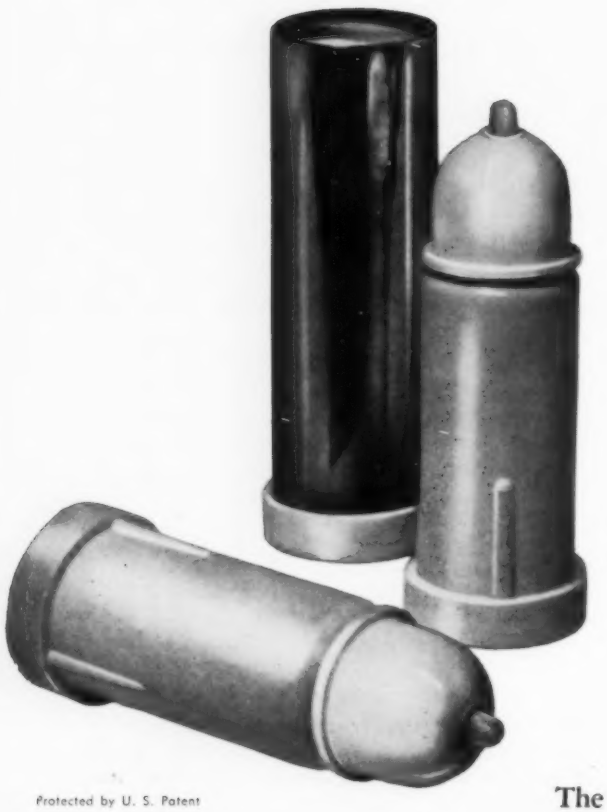
RICHFORD SPILLPROOF PERFUME FLACONS

The magic, purse-sized perfume flacon still making sales history is proud of its volume producing running mate, the—

RICHFORD TOUCH-N-FLO*

PURSE DISPENSER

*TRADE MARK



Protected by U. S. Patent

The one perfect purse container for Lotions, Cream Sachets, Liquid Soaps, and Deodorants, etc.

TOUCH-N-FLO will not leak, yet the contents flow easily with a gentle touch to the skin. Unbreakable plastic bottle and sure-acting dispenser handsomely covered with a snug gold metal cap. Contents 10 cc.

Available with polished brass slip-on cap for glass or plastic containers.

Write for Samples and Prices

THE RICHFORD CORPORATION

404 FOURTH AVENUE, NEW YORK 10, N. Y.

Patent THOUGHTS AND TRENDS *by Thomas Cifelli, Jr.*

DENTAL DECAY PATENT DEVELOPMENT

(Continued from page 759)

that such amount has no effect. The defendants have also relied upon the Kesel paper of 1945 as an anticipation of Kesel. "Deamination of Amino Acids by the Human Oral Flora: Its Role in Dental Caries Immunity." Defendants' Exhibit 4D-20. This was cited, as was Grove, before the same patent examiner. It does not disclose a formula for a dentifrice.

Dr. Stephan et al. published an article in February, 1944, on the effect of urea upon lactobacilli. He experimented from .01 per cent to 50 per cent of urea and reported on the pH of plaques material in 1943. The defendants claim this is anticipatory as urea breaks down in the mouth to ammonia. The examiner was familiar with Stephan's work. Nowhere does Stephan suggest the use of urea to stimulate the aerogenes bacteria, nor does he teach the use of dibasic. Dr. John B. Lewis, Director of Research of Amm-i-dent, Inc., recognized that the use of both Kesel and Wach dentifrices promoted the growth of an organism which had an inhibitory effect referred to as bacterium latic aerogenes.

(7) As against Wach the defendants press these patents as anticipatory: Meiser (1934) 1,951,581; Jones (1948) 2,452,054 (using a priority of 1944). Jones was cited. Meiser was referred to by the same examiner in Henschel. It is for a fertilizer. It certainly is not analogous art and could not be anticipatory of a dentifrice. See Copeman Laboratories Co. v. General Plastic Corp., 149 F.2d 962, 65 USPQ 550; General Metals Powder Co. v. S. K. Wellman Co., 157 F.2d 505, 71 USPO 23, certiorari denied 329 U.S. 812, 72 USPQ 529; Nordberg Mfg. Co. v. Woolery Machine Co., 79 F.2d 685, 27 USPQ 189. See also 69 C.J.S., Patents, § 23, p. 202, and cases cited therein at note 83. For the same reason Jones may be equally discarded as it pertains to a fire extinguisher.

The publications upon which main reliance is placed to anticipate Wach is Stephan and Grove & Grove. The 1944 publication of Stephan was cited and discarded. The examiner was familiar with all of Stephan's publications as shown by the file wrapper of Kesel, Wach and Henschel. It has been discussed as to its anticipatory effect upon Kesel. For the same reasons it is not anticipatory of Wach. Dr. Henschel cited Grove & Grove in his paper of 1945. It had not suggested to him the use of dibasic.

On the Question of Utility

To the contention of the defendants that neither Kesel nor Wach had utility the court showed a liberal approach to this question. It pointed out that neither of the patents claims to be a cure-all for decay but in fact showed progress in solving a health problem. The court was impressed by the fact that Kesel experimented with dibasic dentifrice on some 55 individuals and with a few exceptions these patients were aided by the use of dibasic dental compound. The court was not impressed with the defendants' insistence that dibasic has no effect on lactobacillus and that it is most doubtful that lactobacillus has any relationship with dental caries. The court bluntly stated that this was a strange argument inasmuch as Henschel also taught the inhibition of lactobacillus.

Judge Platt also referred to the experiments conducted in Peoria and Aurora under a University of Illinois appropriation of $50,000 to study the effect of ammoniated dentifrices on the teeth of children. The dentifrice used in the Peoria study contained three per cent urea and five per cent dibasic. The clinical survey was conducted by the Illinois Department of Public Health. Statistics were tabulated by statisticians employed by that department. It appears that the results showed a 16 to 17 per cent reduction in caries among children using the ammoniated dentifrice.

The defendants offered experiments to show the non-utility of Wach. The court was not impressed with such experiments and said that since partial success had been obtained this was sufficient evidence of utility.

On the Question of Synergism

The defendants stressed that since Wach consists of a combination of two old elements, dibasic and urea, and since there is no evidence that these elements have cooperating effects in the mouth, the patent is invalid. The court rejected this contention, first on the ground that it is questionable whether synergism must be proved to obtain a patent on a chemical composition, and second on the ground that there was evidence which disclosed synergistic action. In this connection the judge cited evidence from Henschel's own file wrapper. It appears that Dr. Singer, Block Drug Director of Research, stated under oath:

> Much less activity exists with lower concentrations of urea. A solution containing five per cent diammonium hydrogen phosphate and three per cent urea has only slightly more activity than diammonium hydrogen phosphate alone and the pH of the tooth returns to its normal level within

For precision and versatility—choose
OWENS-ILLINOIS for PLASTICS

For example—
Plastainer vials . . . available in clear plastic and a wide variety of attractive colors, opaque and transparent, with colorful matching closures.
For example—
A handy tumbler
For example—
A lady's compact
Your Name

Owens-Illinois packaging know-how and high-quality standards offer you the *finest* in molding plastic facilities . . . Injection molding . . . Compression molding . . . A complete range in plastics for packaging, for specialties.

Branch Offices:

Albany.....New York	Columbus.....Ohio	Memphis.....Tennessee	Portland.....Oregon
Atlanta.....Georgia	Dallas.....Texas	Milwaukee.....Wisconsin	Richmond.....Virginia
Baltimore.....Maryland	Denver.....Colorado	Nashville.....Tennessee	Rochester.....New York
Birmingham.....Alabama	Detroit.....Michigan	New Orleans.....Louisiana	St. Louis.....Missouri
Boston.....Massachusetts	Fresno.....California	New York.....New York	St. Paul.....Minnesota
Buffalo.....New York	Houston.....Texas	Oakland.....California	Salt Lake City.....Utah
Charleston.....West Virginia	Indianapolis.....Indiana	Oklahoma City.....Oklahoma	San Francisco.....California
Charlotte.....North Carolina	Jacksonville.....Florida	Omaha.....Nebraska	Seattle.....Washington
Chicago.....Illinois	Kansas City.....Missouri	Peoria.....Illinois	Toledo.....Ohio
Cincinnati.....Ohio	Los Angeles.....California	Philadelphia.....Pennsylvania	Yakima.....Washington
Cleveland.....Ohio	Louisville.....Kentucky	Pittsburgh.....Pennsylvania	

OWENS-ILLINOIS PLASTICS
AN (O) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES • TOLEDO 1, OHIO

20 to 40 minutes whereas the high urea concentration keeps the pH elevated for more than two hours.

The court interpreted this evidence as showing that Dr. Singer admitted that there is some synergism in Wach and more so in Henschel or Amm-i-dent.

Commercial Success

The court was impressed with the commercial success met by the Kesel and Wach patents. In this connection, the court pointed out that licenses have been issued by the plaintiff to Colgate, Pepsodent, the manufacturers of Ipana, Dr. Lyon's, Kolynos, Walgreen's, Texall, and McKesson and Robbins.

Infringement

The defendants contended that the Wach claims should be read so as to be limited to a formula of not more than 10 per cent of urea. The court disagreed, saying that it would have to ignore entirely the term "at least one per cent by weight of urea and at least one per cent by weight of the phosphate present in the dentifrice." Also, the court felt that this entire contention was exploded by Dr. Henschel himself who was quoted as having said:

> "I would like to see a stop to the phrase 'high' urea right here and now. Just because it is almost meaningless.
>
> The human body can easily tolerate up to five per cent of urea all over the body, and the mouth is no different.
>
> So that it is not a question of high urea. It is not high urea. The so-called high urea formula is a pretty low urea when it is actually used.
>
> You see, if you analyze the material which is presented to you, you will see that Dr. Kesel's published work was with using concentrations which were quite similar, if not higher, than my percentages. They are not low. They are higher if anything."

With regard to the question of infringement of the Kesel patent, it would appear from the decision that the chief reliance of the defendants was the argument that Kesel does not inhibit lactobacillus and therefore could not be infringed. The court cited evidence of Dr. Singer and Dr. Lewis taken from their affidavits in the Henschel file wrapper, as well as that of Dr. Henschel in his patent, as verifying that dibasic does inhibit lactobacillus. Also, according to the court Dr. Rosenthal of Block Drug Company made the same finding. The court also used some of the defendants' own advertising in coming to its conclusion that infringement was shown. In this connection it pointed out that the

> "Reader's Digest," February, 1949, issue, carried a condensed article from "Better Homes & Gardens." The title was "New Brushoff for Dental Decay." It extols the value of the use of ammoniated dentifrice. In a footnote it identified "Amurol" as an ammoniated tooth powder accepted by American Dental Association and manufactured under license of the University of Illinois Foundation. Amm-i-dent was then advertised to gain the benefit of this publicity, by direct reference to the "Reader's Digest" article. It was stated in advertisements "Amm-i-dent contains carbamide (synthetic urea) and dibasic ammonia phosphate. Amm-i-dent cuts down Lactobacillus Acidophilus, a major cause of tooth decay. Amm-i-dent is pleasantly flavored." Later advertisements were worded "Amm-i-dent—The Ammoniated Tooth Paste" "Amm-i-dent Reduces Tooth Decay." Defendants were obviously commending Amm-i-dent as an ammoniated dentifrice functioning the same as Wach and Kesel. This manifested infringement.

Dentifrice Containing Tyrothricin

Lever Brothers recently obtained U. S. 2,723,217 on a dentifrice comprising tyrothricin and an insoluble polymetaphosphate.

It appears that aqueous dispersions of tyrothricin are effective in reducing the lactobacillus count and in inhibiting the formation of lactic acid in vitro. However, in the presence of dicalcium phosphate, tricalcium phosphate or chalk, polishing agents customarily employed in dentifrices formulations, the tyrothricin displays a considerably reduced effectiveness. The Lever Brothers inventors claim to have found when a water-insoluble salt of a polymetaphorphoric acid is incorporated in tyrothricin-containing dentifrice and substituted for from five to 95 per cent of the calcium and magnesium carbonates and phosphates heretofore employed as polishing agents the dentifrices thereby obtained permit the tyrothricin to be available in a homogenously disbursed and highly effective form, which was not the case when the insoluble polymetaphosphate was absent.

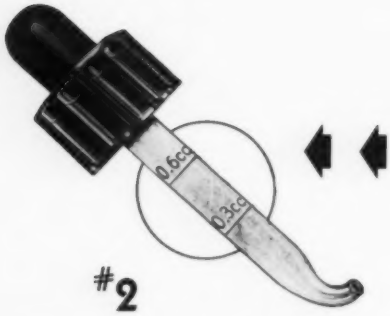
Example 1 taken from the patent is reproduced below:

The following is an example of a series of tooth paste formulations:

	1 *Per Cent*	2 *Per Cent*	3 *Per Cent*
Tyrothricin	....	0.05	0.05
Insoluble sodium polymetaphosphate	26.92	26.89	....
Dicalcium phosphate	26.91	26.89	53.78
Gum tragacanth	1.33	1.33	1.33
Saccharin	0.20	0.20	0.20
Flavor	0.90	0.90	0.90
Sodium lauryl sulfate	1.14	1.14	1.14
Glycerin	18.90	18.90	18.90
Propylene glycol	1.00	1.00	1.00
Distilled water	22.70	22.70	22.70
	100.0	100.0	100.0

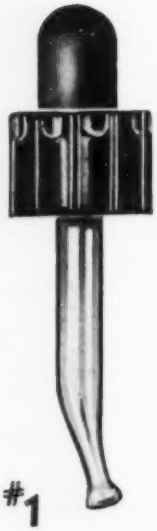
(Continued on page 838)

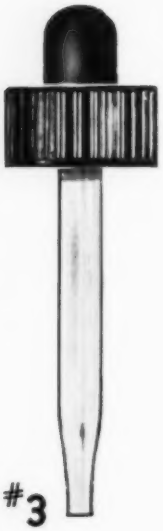
New Perfection DROPPING PARTS



#2

ACCURATELY CALIBRATED In Any Color


#1


#3

This Inexpensive EXTRA FEATURE Adds A Welcome Convenience To The Use of Your Product

Accurate calibration of New Perfection dropper glasses adds immeasurably to the user's satisfaction with your product. Not only is the specified dose measured with more precision, but the tedious and time-wasting practice of counting drops is made unnecessary.

Trade-marks or firm names may also be imprinted on the glass, assuring that the name will be identified with the product each time it is used.

#4

We can supply various colors of bulbs in natural rubber or in our special oil-resisting Amekine compound, caps of plastic or metal in many sizes and colors, and various types of dropper glasses in any length. New Perfection dropping parts will fit your own bottles, or can be supplied in combination with our Modernistic bottles in Amber, Blue, Green or Clear glass. Sizes: ⅛, ¼, ½, 1 and 2 oz.

Write for Samples and Quotations

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"Glass Goods of the Better Kind"

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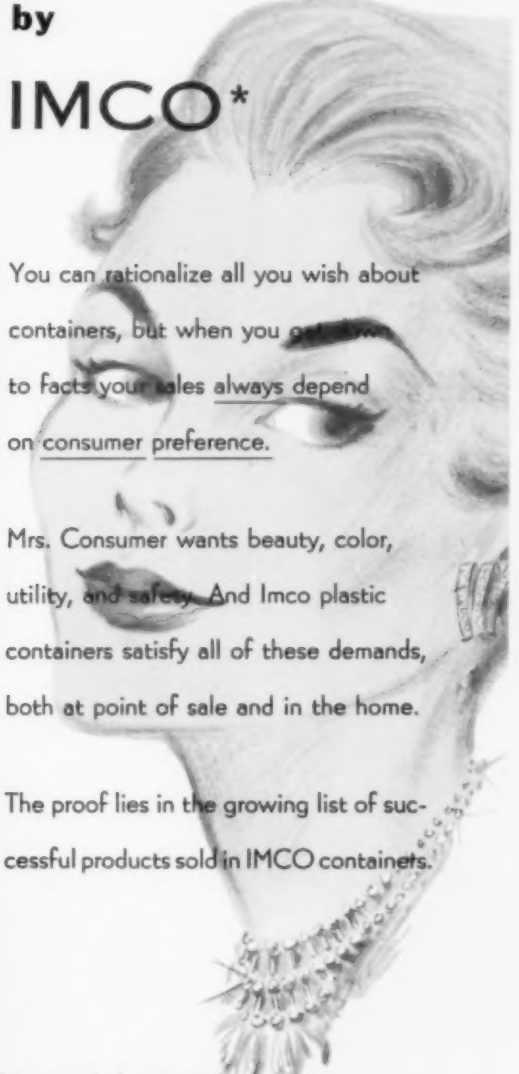
Successful Merchandisers Know

she prefers containers by

IMCO*



You can rationalize all you wish about containers, but when you get down to facts your sales always depend on consumer preference.

Mrs. Consumer wants beauty, color, utility, and safety. And Imco plastic containers satisfy all of these demands, both at point of sale and in the home.

The proof lies in the growing list of successful products sold in IMCO containers.

May we help you solve your container problems?

IMCO CONTAINER CORPORATION . . . . . .

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75TH AND CLEVELAND STREETS
KANSAS CITY 30, MISSOURI

*IMCO BOTTLES SHOW THE FLEXCEL TRADE MARK

DU PONT CEL-O-SEAL BANDS

REG. U. S. PAT. OFF.

- assure quality and purity
- prevent substitution, tampering
- highlight trade-marks, brand names

"For 60 years MM&R's reputation—as well as that of our customers—has depended upon the quality and purity of the essential oils, concentrated flavors, perfume oils and related materials packaged under our Label, Seal & Guarantee.

"Our guarantee to the customer that he receives these delicate products exactly as they are prepared is the tamperproof Du Pont 'Cel-O-Seal' band on each bottle. In addition to doing such an effective job of protecting the product, the band also highlights our world-famous trade-mark.

"We are proud of our products and the quality tradition behind the MM&R name. With 'Cel-O-Seal' we are certain of safeguarding both."

Joseph Baird Magnus, *Vice President*,
Magnus, Mabee & Reynard, Inc.

Decorative and functional Du Pont "Cel-O-Seal" bands will work for your package, too. They hold closures tight, guard against tampering and spillage, inspire consumer confidence. Bands are custom-designed to complement *your* packaging needs. (They can be hand- or machine-applied.)

FREE PACKAGING SERVICE: See what "Cel-O-Seal" can do for *your* package. Send us a labeled container. Our packaging specialists will band it, return it for your inspection. No charge, no obligation. Write: E. I. du Pont de Nemours & Co. (Inc.), "Cel-O-Seal" Section, 10424-I Nemours Bldg., Wilmington 98, Del. "Cel-O-Seal" cellulose bands are also sold by Armstrong Cork Company, Lancaster, Pa.

DU PONT CEL-O-SEAL BANDS

REG. U.S. PAT. OFF.

DU PONT
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BETTER THINGS FOR BETTER LIVING
... *THROUGH CHEMISTRY*

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CORPORATION
HILLSIDE, NEW JERSEY
Waverly 3-0400

St. Louis 1, Missouri: Marvin Yates Co., Arcade Building
Cincinnati 8, Ohio: Ralph H. Auch, 3449 Custer Road
New Orleans 19, Louisiana: R. P. Anderson Co., 925 N. Solomon Pl.
Houston 19, Texas: R. P. Anderson Co., 5643 Overbrook Lane
Lombard, Illinois: Delmar Ring, R.R. #1, Swift Road

Dallas 2, Texas: R. P. Anderson Co., 1122 Texas Bank Building
West Coast: Wm. J. Stoepker, 301 E. Colorado, Arcadia, California
Canada: Sun Tube Corp., 145 Spruce Street, Ottawa, Ontario
Mexico: Tubos de Estano, S. A. de C. V., 174 Oriente No. 267, Colonia Montezuma, Mexico, D. F.

Our new bottle, number 442, makes a very practical and attractive container for products like hand lotion, toilet water and cologne, as well as after shave lotion. They can, of course be supplied with fired-on ceramic labels of your own design. We welcome your inquiry about the sizes in which you are interested.
After Shave Lotion
442
CARR-LOWREY GLASS CO.
Designers and manufacturers of fine glass containers
Factory and Main Office: BALTIMORE 3, MD. • New York Office: 40 W. FORTIETH ST. • Chicago Office: 1572 MERCHANDISE MART

LOOK AT THE FLOOR . . .

you'll see why this cap cuts breakage

Run a test with Armstrong Hi-Tork® Caps, and then check the floor. It will be *clean*. You'll see hardly a trace of the cap breakage that's such a familiar sight near high-speed lines.

The credit for the clean floor goes to the extra strength of Armstrong Hi-Torks. They are carefully designed so that each section—dome, thread, and skirt—takes its exact share of heavy capping impact. That's why Hi-Torks reduce cap breakage, even at high line speeds.

You can see the efficiency of Armstrong Hi-Tork Caps proved by a test run, and we'll be glad to help set it up. Just get in touch with your near-by Armstrong office. Or write Armstrong Cork Co., Glass and Closure Division, 5312 Chambers St., Lancaster, Pennsylvania.

Armstrong "HI-TORK" MOLDED CAPS

Seek the truth and teach it!

Usually our advertisements are published in the hope of arousing your interest in one or more of our products or services. This message has nothing to do with the things we sell.

Its purpose is to ask you to give thought, not only as individuals but as corporations, to the financial situation of our colleges and universities. We share the conviction that the continuance and development of our form of government and of our business system are dependent upon the adequate maintenance of our educational system and on its traditional freedom to seek the truth and teach it.

Financial problems have been spiraling for even the most secure of our institutions over the past fifteen years. These same institutions must now prepare themselves to educate sharply increased numbers of young people in the years directly ahead. The problem of maintaining the quality of higher education will be insurmountable if adequate finances cannot be found.

Business in general is rapidly recognizing its interest in the educational field and its obligations toward it, for business is increasingly dependent on education for executive and technical manpower.

This is not an appeal for any individual college or university. It is a plea that business concerns give serious attention to the subject and evaluate their responsibilities in the light of their own judgment.

In recent years a great deal of literature has been developed on the ways and means of corporate aid to education. Some colleges and universities have formulated definite programs and are prepared to suggest suitable methods. For general purposes, The Council for Financial Aid to Education, Inc., 6 East 45th Street, New York 17, N. Y., is a non-profit organization specializing in the field. It aims to provide a source of authentic information on the financial needs of American higher education; the programs of colleges and universities in seeking financial help; and to the extent authorized by them, the aid-to-education policies and programs of various donors. It neither solicits, accepts nor disburses funds for financial aid to education. Following is its published statement: "The Council for Financial Aid to Education has compiled information ordinarily useful in determining aid-to-education programs. Its information facilities are available, on request, to any interested corporation."

Basic Products for the Pharmaceutical Industry

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The Full Line Fine Chemical House

the New York Quinine & Chemical Works, Inc.

50 CHURCH STREET, NEW YORK 8, N. Y.

NEWS...

Named to Vick Exec. Posts

C. H. Carter, J. G. Morrison and H. A. Shull have been appointed operating vice-presidents of Vick Products division, Vick Chemical Co. They will direct all operations of the division and continue to serve as members of the divisions planning board.

Mr. Carter is in charge of the following product departments: cough syrup, cough drops and Sofskin. Mr. Morrison is in charge of VapoRub, Va-Tro-nol, inhalers and lozenges. He also heads the Canadian marketing operations.

Mr. Shull is in charge of new product development.

H. A. SHULL

Sinclair Addresses CIBS

Frazer V Sinclair, editor of Beauty Fashion, delivered a talk on Cosmetic Selling at the November 10 meeting of the Cosmetic Industry Buyers and Suppliers (CIBS) at Toots Shor's Restaurant. He compared the change that has occurred in methods of selling cosmetics in recent years.

Stating that selective distribution is giving way to mass distribution, he pointed out that television has had a very great effect on consumer buying. While some cosmetic firms previously restricted their products to certain stores, this is no longer feasible now that millions of people see these products advertised by a single demonstrator on one television program. It is now necessary for these firms to resort to mass distribution in order to support their television advertising.

Today's cosmetic selling methods are based on mass class distribution in a mass class market with the consumers showing very little preference for the store in which they buy the cosmetics.

Reddish with James Varley

Dr. George F. Reddish, formerly chief bacteriologist for Lambert Pharmacal Co., now a division of Warner-Lambert Pharmaceutical Co., has been appointed consultant to the research department of James Varley & Sons. He will serve as adviser in connection with research activities on disinfectants and fungicides.

Thomas Addresses Perfumers

Gregory H. Thomas, president of Chanel, Inc., was guest speaker at last month's meeting of the American Society of Perfumers, held at the Advertising Club on November 16. He spoke on "The Problems of Morocco," discussing the economic and political difficulties of that country which have a bearing on essential oil production.

C. H. CARTER

Terramycin Production in France

Chas. Pfizer & Co., in partnership with the French firm of Clin-Byla, recently completed an antibiotics plant at Massy near Paris at a cost of about $2 million. The plant is now producing enough Terramycin and Tetracyn, states John E. McKeen, president, to supply all of France's needs, saving that country several million dollars in foreign exchange yearly. The plant is constructed in such a way that its capacity can be almost tripled, using the existing building space. Easily demountable walls provide for expansion beyond that.

Appointed by Hazel-Atlas

J. H. Kaylor has been appointed production manager of the Hazel-Atlas Glass Co. and will be located at the general office in Wheeling, W. Va. He was formerly superintendent at the firm's Montgomery, Ala., glass container plant.

Swanson, V.P., Nopco

Harold A. Swanson has been elected vice-president of the Nopco Chemical Co. in charge of its vitamin and fine chemicals division, according to Ralph Wechsler, president. For many years he had been general counsel for the company and then, for five years, general sales manager of Nopco's Pacific division.

Shadle Named by P-D

Dr. George M. Shadle has been appointed medical coordinator in the sales department of Parke, Davis & Co., according to Graydon L. Walker, vice-president and director of U.S. and Canadian sales and promotion. He has been with the company since 1952 as a member of the clinical investigation staff in Pittsburgh.

J. G. MORRISON

Searle Expansion in Canada

G. D. Searle & Co. is planning construction of larger facilities to increase its service to the Canadian medical and drug professions. The four-acre tract of land in Brampton, Ontario, has been purchased, and ground will be broken shortly for a structure which will house limited manufacturing facilities and complete packaging and warehousing services, as well as Searle's Canadian head office.

This Canadian project will be owned and operated by G. D. Searle & Co., of Canada, Ltd., a subsidiary of the Chicago company.

John G. Searle, president of the parent company, and Franklin P. O'Brien, president of the Canadian firm, stated that Searle's expansion in Canada has gone beyond the capacity of present Canadian packaging and warehousing facilities at 309 Weston Road, Toronto.

The new structure is expected to be completed by April, 1956.

From the Felton laboratories in Versailles...

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For perfume extracts, toilet waters, creams, powders, soaps, etc.

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DR. ANTONIE T. KNOPPERS

Knoppers, V.P., Merck Internat.

Dr. Antonie T Knoppers, formerly director of scientific activities, has been appointed vice-president and general manager of the Merck-Sharp & Dohme international division, Merck & Co., according to James H Sharp, division president. He fills the vacancy created by the election of John T Connor as president of Merck & Co.

Stokes Machine Promotions

Samuel H. Greenwood has been promoted to field sales manager for F. J. Stokes Machine Co., and has been succeeded by Fred Hilsley as district manager of the Philadelphia territory.

Cos. Chemist Elections

Sabbat J. Strianse has been elected president-elect of the Society of Cosmetic Chemists; Robert A. Kramer has become secretary; Walter A. Taylor, treasurer; and Gabriel Barnett and Savery F. Coneybear, directors.

Honored by Fritzsche

Mrs. Elizabeth Adelmann, Barbara Schmidt, Herman Goossen and Walter Gorman were guests of honor at a cocktail party and dinner on November 10 held by Fritzsche Brothers for its Quarter-of-a-Century Club. Forty other members and officers, including Board Chairman Frederick H. Leonhardt and President John H. Montgomery, also attended the affair, at the New York Athletic Club. Every one especially appreciated the cheery words of Mr. Leonhardt who recently recovered from an illness.

After the dinner, Dr. Ernest Guenther, vice-president and technical director, showed his most recent colored motion pictures which he took in Southern Europe and North Africa.

PAUL E. WEBER

Weber Promoted by Pfizer

Paul E. Weber has been appointed sales manager of the chemical sales division, Chas. Pfizer & Co. He succeeds Frank F. Black who has resigned from this position and is severing his connection with the firm at the end of this year.

Mr. Weber has been with Pfizer since 1938 when he served as a field sales representative. He became Western regional manager in 1948, was appointed national field sales manager in 1953, and assistant sales manager at the Brooklyn headquarters in 1954.

Wins Wellcome Prize

Colonel Bowers, Chief of the Department of Surgery at Brooke Army Hospital, Ft. Sam Houston, Texas, and Professor of Surgery at the Graduate School of Baylor University, Indiana, received the Wellcome Prize on November 9. The Award was presented at the 62nd annual meeting of the Association of Military Surgeons of the United States.

The prize essay for 1955 was entitled "Surgical Treatment in Abdominal Trauma: A Comparison of Results in War and Peace."

Retires—40 Yrs. with Chiris

Joseph Maunier, who succeeded his father in Antoine Chiris, has retired from the firm as commercial manager. He has been with the company for 40 years in various capacities from salesman to commercial manager. He will continue to live in Grasse and remain associated, though not actively, with the Chiris Company as advisor on technical and commercial matters.

Jacques Maisondieu, who joined Chiris about 12 years ago as assistant to the commercial manager, was later named sales manager and deputy commercial manager. He will now take over the job of commercial manager and at the same time will continue as sales manager.

Other officers of the company are Dr. Georges Igolen, technical manager; Louis Benezet, assistant technical manager; and Pierre Carnot, chief perfumer.

Recently Dr. Manfred Vock, who is a well-known German food and flavor chemist, became head of the firm's flavor division. This division has increased both in personnel and in output many times during the last few years.

The industrial aromatic manufacturing department of the French Company now has a modern addition to the factory which was recently constructed. Antoine Chiris, Grasse, is functioning with one of the most modern and up-to-date isolation plants in the world.

Appointed by Vick Products

E. B. Gellert, R. M. Fenner and D. R. Moore have been appointed product managers and H. W. Finch, Canadian Manager, in charge of marketing, of Vick Products division, Vick Chemical Co.

Mr. Gellert has become product manager for Sofskin; Mr. Fenner, for Cough Syrup; and Mr. Moore, for VapoRub.

Fritzsche Brothers Quarter Century Club annual party at New York Athletic Club which was held in honor of four new members—Barbara Schmidt, Mrs. Elizabeth Adelmann, Herman Hossen and Walter Gorman.

Receive 1955 Kimble Award

Four U. S. Public Health Service scientists, Paul W. Kabler, M.D., Ph.D.; Harold F. Clark, M.A.; Edwin E. Geldreich, M.S.; and Harold L. Jeter, M.A.; have been selected for the 1955 Kimble Methodology Research Award for an outstanding contribution to the field of public health. They are responsible for a faster and more accurate method of analyzing the bacteriological content of water, a development which could provide a potent defense against germ warfare.

The four recipients are all connected with the Robert A. Taft Sanitary Engineering Center of the Public Health Service at Cincinnati.

Through the method these men developed, it is possible to incubate, count, and identify the bacteria from a sample of water in as little as 16 hours as compared from 48 to 96 hours by conventional analysis.

The Kimble Award, which includes $500 in cash and an engraved plaque, is sponsored by the Kimble Glass Co., a subsidiary of Owens-Illinois Glass Co.

Dr. Paul W. Kabler, 2nd from left, accepting Kimble Methodology Research Award for 1955 from Dr. Howard Bodily, chairman of Awards Committee of Conference of State and Provincial Public Health Laboratory Directors at Kansas City. Looking on are Harold F. Clark, left, U. S. Public Health Service, and E. J. Rhein, scientific division, Kimble Glass Co.

Lilly Exec. Changes

J. R. Stamper, vice-president and general manager of Eli Lilly & Co. (Canada) Limited, is moving to Indianapolis as an associate director of Eli Lilly International Corp.'s British and Eurasian Area.

Oscar W. Funk, manager of Lilly's Washington district, will succeed Mr. Stamper.

Milton L. Meisner, manager of the New York north district, will be transferred to Washington.

Singer with Eastco

William L Singer, formerly manager of special sales, Allen B Wrisley Co., has joined Eastco, Inc., White Plains, N. Y., as merchandising manager.

WILLIAM L. SINGER

Cairns, Hercules Research Dir.

Dr. Robert W Cairns, assistant director of Hercules Powder Company's research department since 1945, has been appointed director of research. He succeeds Dr. Emil Ott who has resigned to join Food Machinery & Chemical Corp.

Elected to French C of C

Maurice G. Couderchet, president of Charabot & Co., has been elected to the board of directors of the French Chamber of Commerce of the U.S.A.

McCarty with Onyx Oil

George McCarty has joined the West Coast sales force of Onyx Oil & Chemical Co., Jersey City, N. J. He will work out of the Los Angeles office, making frequent trips to the San Francisco Bay area.

He was formerly sales agent for Synfleur Scientific Laboratories, and prior to that, had also been associated with the E. S. Browning Co., in Los Angeles and San Francisco, and Carolina Aniline & Extract Co.

GEORGE McCARTY

Kolmar Executive Changes

As of December 1, Lessing Kole became chairman of the board of directors of Kolmar Laboratories, and W. J. Wick became president of the firm. Also the following staff members were appointed officers: R. L. Kole, vice-president and treasurer; J. B. Rix, secretary; Dr. H. Heinrich, vice-president and director of research; G. J. Entringer, vice-president and controller; R. M. Neuman, vice-president in charge of eastern manufacturing operations; C. R. Kircher, vice-president in charge of lipstick research; M. E. Spinapolice, vice-president in charge of product development; and E. J. Maruszewski, vice-president in charge of world-wide manufacturing standards. In addition, Dr. Otto Jacobi was named assistant director of research, William Buth was named chief development chemist, and Henry Groh was appointed president of Kolmar-Wilckens in Canada, replacing Fred Wilckens who is retiring for reasons of health.

These are the officers of Kolmar Laboratories. The heads of Kolmar's subsidiary and affiliated companies are: J. B. Rix, president of Kolmar International; J. M. Markham, president of Kolmar Cosmetic Specialties; and W. J. Wick, president, and Dr. H. Heinrich, vice-president of Wickhen Products.

Wickhen, which is the chemical division of Kolmar, is owned to the extent of 60 per cent by staff members of Kolmar such as Wick, Heinrich, Entringer, Neuman, Kircher, Spinapolice, and Maruszewski, while Kolmar Laboratories has only a 40 per cent interest. This was done to express appreciation and to build up estates for the top personnel. Kolmar will continue to integrate other young staff members into either Wickhen or Kolmar.

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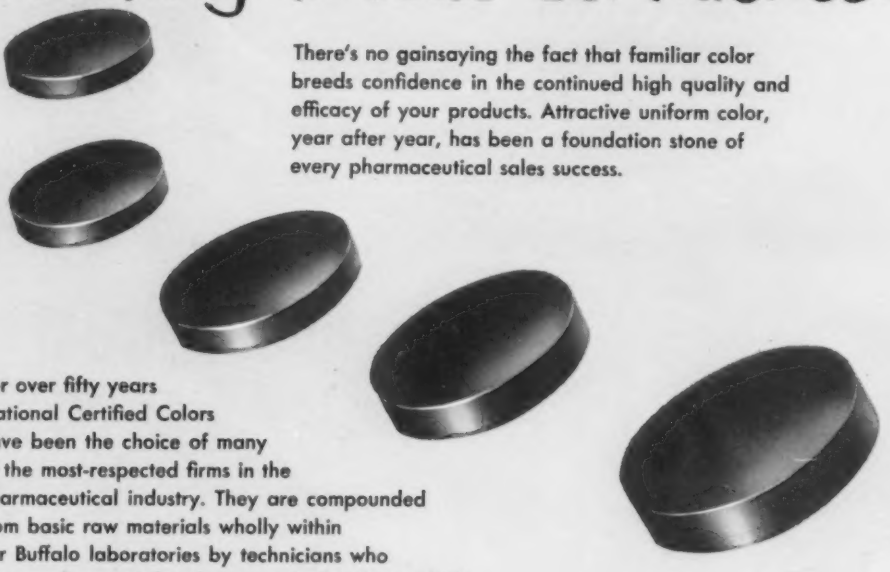
IN PHARMACEUTICALS

Familiarity breeds confidence...



There's no gainsaying the fact that familiar color breeds confidence in the continued high quality and efficacy of your products. Attractive uniform color, year after year, has been a foundation stone of every pharmaceutical sales success.

For over fifty years
National Certified Colors
have been the choice of many
of the most-respected firms in the
pharmaceutical industry. They are compounded
from basic raw materials wholly within
our Buffalo laboratories by technicians who
know and respect the pharmaceutical industry's high
standards of manufacture. They are noted for uniformity
of shade, pure-dye strength and chemical composition.

We will be pleased to extend technical help
on formulation and use of certified colors.

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ALBERT L. SHUTTS

PHILIP H. SAGARIN

MICHAEL J. HICKEY

Shutts Appointed by Becco

Albert L Shutts has been appointed manager of the New York territory of Becco Chemical Division, Food Machinery and Chemical Corp., according to John F. Shea, vice-president in charge of sales. He will cover Vermont and parts of New Jersey, Massachusetts, Connecticut and New York State.

He succeeds Eric A. Hansen, former manager, who retired.

Pfizer Center in Dallas

Chas. Pfizer recently opened a new Southwestern Distribution Center in Dallas which is serving a seven-state area. John E. McKeen, president and chairman of the board, and a group of Pfizer executives, were hosts at an open house and buffet which was attended by about 250 civic and business leaders and members of hospital and pharmacy groups in the Dallas-Fort Worth area.

To mark the opening, Mr. McKeen presented a donation of antibiotics and nutritional products to Chief Pharmacist Reuben G. Lewis who accepted them on behalf of the Children's Medical Center of Dallas.

James J. Farnsworth, administrator, also took part in the ceremony for the Center, which includes the Bradford Hospital for Babies, the Children's Hospital of Texas, the Morgan Tuberculosis Hospital and the Freeman Memorial Clinic.

Pfizer Distribution Center

Chas. Pfizer & Co. has established a distribution center in Portland, Ore., to serve the Northwest. It will be known as the Pfizer Northwestern Distribution Center and is expected to be opened on February 1, 1956. Serving the states of Oregon, Washington, Montana and Idaho, the Center will be used by the company's four divisions—Pfizer Laboratories, J. B. Roerig & Co., Chemical Sales and Agricultural Sales.

Resigns from Bruner-Ritter

Philip H. Sagarin has resigned as vice-president in charge of manufacturing, Bruner-Ritter, Inc., Bridgeport. He will devote full time to his duties as president and director of VAC Inc., also of Bridgeport. He has been connected with Bruner-Ritter for 16 years, where he was in charge of war production.

Colgate Appointments

Dr W. W. Wellman has been appointed head of the aerosol toilet articles group of Colgate-Palmolive Co., Virgil Richter heads the exploratory oral products group, and Gerald Jahoda has become group leader for the research and development information center.

Shoninger Visits Chiris, France

F. E. Shoninger, president of Antoine Chiris Co., Inc., New York, and managing director of Antoine Chiris, Ltd., London, recently returned from a week's visit to the French company's headquarters in Grasse. While there, he attended top management meetings as a member of the board of directors.

Gunning & Gunning Moves

Gunning & Gunning, Inc., has moved to new quarters at 305 East 46th St., New York.

Hickey Named by Florasynth

Michael J Hickey has been appointed chemist in charge of quality control of perfume, essential oils and related raw materials, of Florasynth Laboratories, according to Joseph H. Fein, treasurer. He has been associated with the essential oil field for 17 years.

Brown Heads Gen. Chemical Div.

Chester M Brown has been named president of General Chemical division, Allied Chemical & Dye Corp., according to F. J. Emmerich, president. Mark M. Riddison, head of the division since 1951, will continue his association with the company in an advisory capacity.

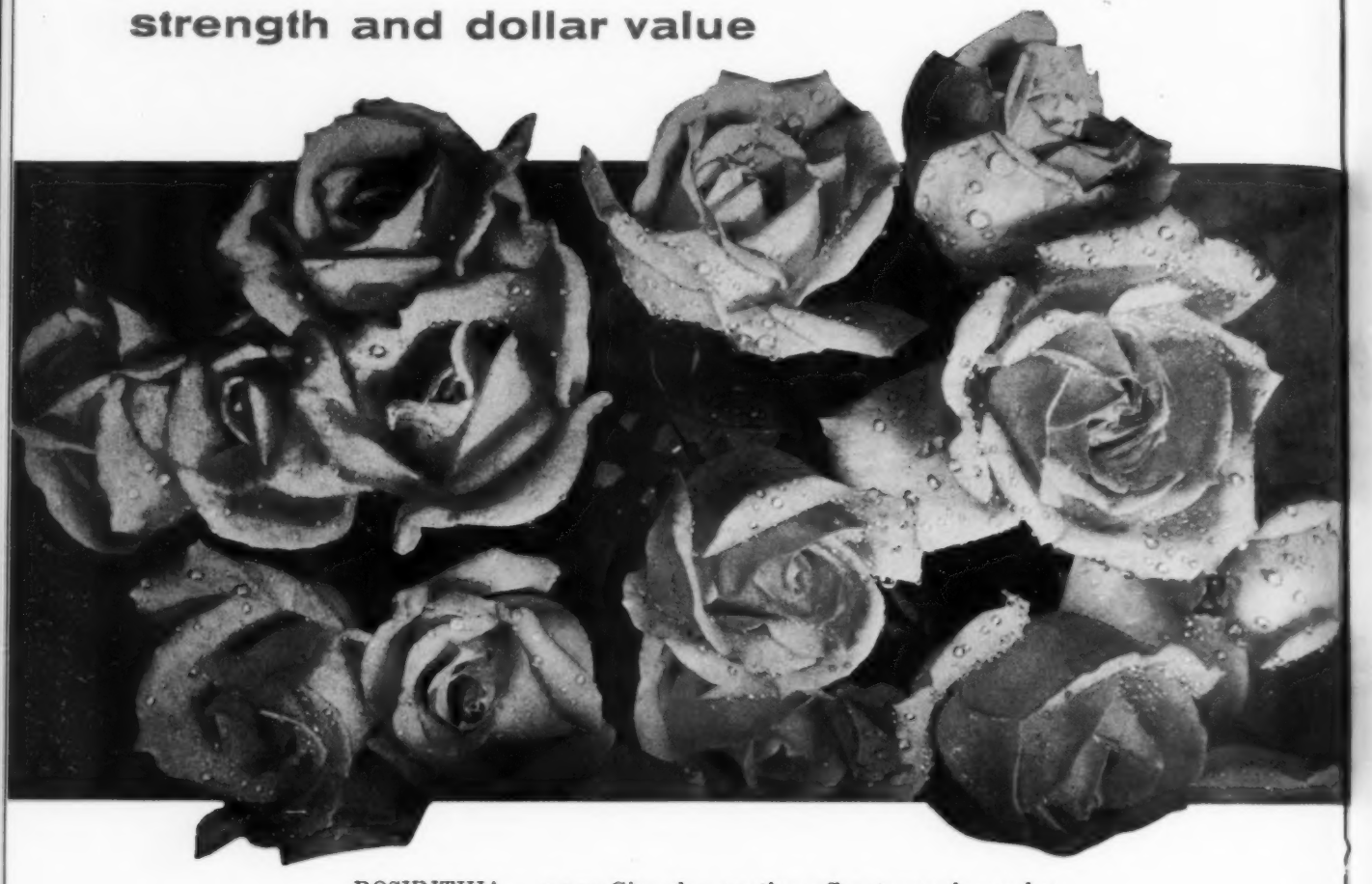
Neumann-Buslee Expands

Neumann-Buslee & Wolfe, Inc., has doubled its plant facilities in order to accommodate increasing customer demands. Frank Vejsada has joined the laboratory staff and has had many years of experience in the formulation of perfumes for the soap, detergent and cosmetic fields.

Louis J. Reif has also joined the sales staff of the company and will service the trade in the Midwest and southern states.

New Southwestern distribution center of Chas. Pfizer & Co., which was recently opened in Dallas. It will be used by Pfizer's four sales divisions, Pfizer Laboratories, J. B. Roerig & Co., and the chemical sales and agricultural sales divisions.

ROSYNTHIA . . . unsurpassed in lasting floweriness, strength and dollar value



ROSYNTHIA . . . a new Givaudan creation, offers tremendous value to the creative perfumer.

Developed after long study of the chemical constituents of natural rose, ROSYNTHIA has all the qualities needed in a specialty of this type . . . floral strength, odor value and lastingness. It can be used as an excellent extender or as a replacement for natural Otto of Rose and Rose de Mai Absolute, having their complementary qualities while offering a large saving in cost, plus the assurance of continued availability and uniformity.

This new development is the latest of many which have established Givaudan as a leader in the field.

GIVAUDAN

Better perfume materials through constant research and creative ability

GIVAUDAN-DELAWANNA, INC.
330 West 42nd Street • New York 36, N.Y.

Branches: Philadelphia • Boston • Cincinnati • Detroit
Chicago • Seattle • Los Angeles • Toronto

To Receive Perkin Award

Edgar C. Britton, director of the Edgar C. Britton Research Laboratory of the Dow Chemical Co., and past president of the American Chemical Society, has been selected as the recipient of the Perkin Medal of the American Section, Society of Chemical Industry, for 1956. The highest award in American industrial chemistry, the Perkin Medal is awarded annually for outstanding achievement in applied chemistry in the United States. The 1956 medal will be presented to Dr. Britton in September, 1956, at a dinner in his honor.

The medal, established in 1906, honors Sir William Henry Perkin and commemorates his discovery of the first synthetic dye in 1856.

Weaver Promoted by Hazel-Atlas

Karl B Weaver has been elected vice-president of operations, Hazel-Atlas Glass Co., succeeding John W. Carnahan. Mr Carnahan formerly vice-president and general factories manager, was relieved of responsibility in the active management of the company at his request. He will continue with the company as a vice-president in a consulting capacity.

Mr. Weaver, who will have full responsibility for the manufacturing division, was formerly vice-president and production manager.

Named Grove Sales Director

Gene K Foss has been appointed director of sales, Grove Laboratories, and will be in charge of the company's overall sales, advertising and promotion operations. He succeeds Russell A. MacDonnell who has resigned.

He was formerly manager of the firm's Fitch division.

Amer. Cholesterol Expands

American Cholesterol Products, Inc. is building a 35,000-square-foot plant and laboratory on a 20-acre site in Edison Township, N. J. The laboratory and office section will take up 5,000 square feet, while a single-story manufacturing building will account for the rest of the space. There is an additional building in the rear which will be used for solvent storage.

Having been in its Milltown, N. J., plant for 16 years, American Cholesterol expects to move into the new plant by February, 1956.

Mayor John L. Suttenfield, Lynchburg, Va., (left) congratulating Charles G. Baber, president of C. B. Fleet Co., on the remodeling of the company's headquarters and plant.

HENRY A. MOLTENI

Molteni, Onyx Plant Manager

Henry A. Molteni has been appointed plant manager in charge of all plant operations, Onyx Oil & Chemical Co. He was formerly assistant director of research in charge of product development and technical service.

New Division for Sun Tube

Sun Tube Corp, has established a new division, Sunex division, as part of an expansion program in sales and production facilities, according to Kenneth Leghorn, president. Kenneth Michel has become general manager of the division and has been succeeded as sales manager of the impact extrusion division by Richard McCarthey.

Donald Goff has been promoted to production manager of the Sunex division.

Claude Alexander has become assistant to the president.

The new division was specifically created to manufacture aerosol valves, polyethylene bottles and plastic closures.

Givaudan Cocktail Party

Givaudan-Delawanna held its annual Fall reception and cocktail party on November 17 at the University Club in New York. Over 350 members of the perfume, cosmetic and allied industries were present.

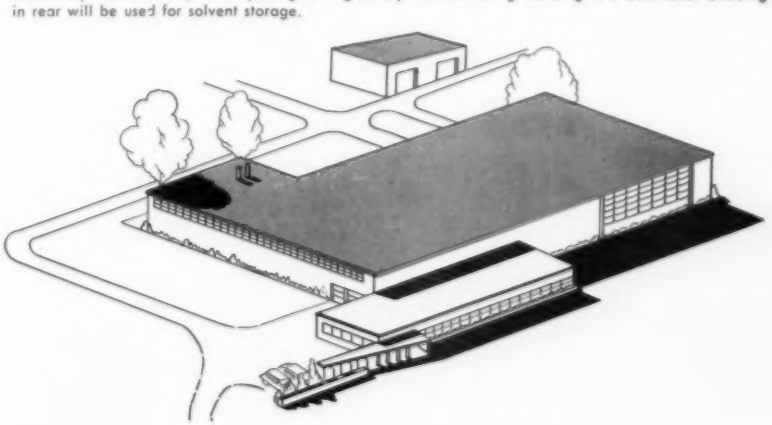
Plastic Art Decorating Co.

Joseph Bardash, formerly of Modern Art Printing Co., is now operating Plastic Art Decorating Co., 68-70 Freeman St., Brooklyn 22, N. Y. F. A. Bergmann is sales manager and William Gonzales, technician. The telephone number is EVergreen 3-7171.

R & G Sales Up

Roger & Gallet reports that this year's sales are 41 per cent ahead of those in 1954. In anticipation of still greater growth in 1956, the company has stepped up the production capacity at the new Roger & Gallet plant at Burgaw, N. C.

New 35,000-ft. plant of American Cholesterol Products in Edison Township, N. J., which will contain laboratory and office space adjoining a single-story manufacturing building. An additional building in rear will be used for solvent storage.



POWERFUL REASONS

why you should use

ASCORBIC ACID

(vitamin C)

SODIUM ASCORBATE

'ROCHE'

● When you buy from 'Roche' you deal with a house of over a half century's experience in the fine chemical field,—a house that produces every useful type of ascorbic acid to meet virtually every manufacturing need; the first to achieve commercial production of vitamin C by the famous Reichstein synthesis.

● Large consumers can have the advantage of single lots running as high as 3000 kilos—uniformly mixed, and necessitating only one assay. This is possible because 'Roche' really produces vitamin C "By the Tons."

● Small users are just as important to us—they get the same 'Roche' service, the experience of a house that for many decades has been in the forefront of vitamin research and manufacturing. 'Roche' technical personnel is equally ready to assist you with development and production problems.

● All types of 'Roche' ascorbic acid are uniform, readily soluble, and easy to handle. 'Roche' scientific production control is meticulous—it guarantees highest quality; specifications that even exceed U.S.P.'s.

● Quick delivery from strategically located warehouses, where a of the following types are stocked to meet your individual produ specifications, and from which fresh material is insured by our hu volume of sales:

Fine Powder — Ultrafine (Mikro) Powder — Granular
Fine Granular — Superfine Granular — Ampul Type
Sodium Ascorbate (fine powder for all purposes)

● 'Roche' packaging is designed to protect the original quality in sealed tamperpruf containers. Refuse to accept material if this seal has been broken or if original 'Roche' label shows signs of mutilation.

● Ascorbic Acid and Sodium Ascorbate 'Roche' are packed i sealed polyethylene bags in 1-kilo and 2½ kilo tamperpruf triplet metal containers. Larger quantities are packed in sealed polyeth lene bags in fibre drums. Smaller quantities in amber screw c bottles. *Ampul type* ascorbic acid is packed under inert gas in 1 gram bottles and in 1-kilo and 2½ kilo tamperpruf metal container

BUY 'ROCHE'—DEPEND ON 'ROCHE'

"The Vital Story of Vitamin C"—an Inside Science story is available in repri form. It is published in the interests of the pharmaceutical manufacture and food processors who make their good products better with essen health-giving Vitamin C.

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San Francisco • Los Angeles • Seattle • Portland • Salt Lake City

In Canada: Hoffmann-La Roche Ltd., 286 St. Paul Street, West; Montreal, Quebec

OTHER 'ROCHE' VITAMINS INCLUDE

VITAMIN A acetate and palmitate • Dry VITAMIN A acetate • Beta CAROTENE, all trans • THIAMINE hydrochloride and mononitrate
RIBOFLAVIN • RIBOFLAVIN-5'-Phosphate Sodium • BIOTIN • PYRIDOXINE hydrochloride • NIACIN • NIACINAMIDE • dl-alpha-TOCOPHEROL acetate & unesterifie

New research building of Plax Corp. in Bloomfield, Conn., which provides work areas and office space for research personnel. A second building, now being constructed, will replace rented space now being used by Plax.

Coutin Heads Ph. Chaleyer

Pierre J. Coutin has been elected president of Ph. Chaleyer, Inc. Mr. Coutin has been associated with the essential oil and aromatic chemical industries abroad and in this country for 28 years.

He has been an active member of the Essential Oil Assn. for a number of years and served as secretary-treasurer until his election as vice-president two years ago.

Klarmann, Pres., CSMA

Dr. Emil G. Klarmann, vice-president and manager of technical services, Lehn & Fink Products Corp., was elected president of the Chemical Specialties Manufacturers Association at its annual meeting earlier this month.

EDWARD M. BLAKE

Hospital Sales Mgr., Lederle

Edward M Blake has been appointed manager of hospital sales for Lederle Laboratories division, American Cyanamid Co., according to Henry Wendt, Jr., director of sales. He was previously sales manager for the Los Angeles district, West Coast region.

Roerig Exec. Appointments

Arthur C. Emelin has been appointed general manager of J. B. Roerig & Co., a division of Chas. Pfizer & Co., according to Thomas J. Winn, president. James W. Bradley, formerly sales manager of Roerig, has become director of sales.

Mr. Emelin was previously director of operations of Pfizer Laboratories.

Pharm., Inc. Buys J & J Plant

Pharmaceuticals, Inc., has purchased Johnson & Johnson's plant in Cranford, N. J., according to Matthew B. Rosenhaus, president, as part of the firm's expansion program. Located on Walnut Ave., the plant has a 117,000 square-foot area and is located on a 30-acre site. Pharmaceuticals, Inc. plans to take possession of the building during the Fall of next year and will employ about 150 persons.

Represents Italian Company

Gr. Uff. Mario Negri visited our offices last month and reported that he represents an Italian company which is equipped to process and package, or manufacture outright, American pharmaceutical products under a licensing and royalty arrangement.

Any one interested in this service, which will sell and distribute American products throughout Italy, should contact Jean R. Graef, Inc., 610 Fifth Ave., New York 20.

Newcomb, Pres. of Malmstrom

E. Allen Newcomb, for the past five years head of the National Wholesale Druggists' Association, has been elected president and chief executive officer of Malmstrom Chemical Corp. Ivar W. Malmstrom, former president, has become chairman of the board.

Plax Expansion

Plax Corp. recently moved into its new research building at Bloomfield, a suburb of Hartford, Conn., a move made necessary by its stepped-up research program. The two-story structure provides work areas and office space for research personnel. A second two-story building, for administrative offices, is now under construction and will bring the total area to nearly 53,000 square feet.

V.P., Reed & Carnrick

Leonard A Friedman, formerly general sales manager of Ives-Cameron Co., has been appointed vice-president in charge of sales of Reed & Carnrick, according to Dr. Arnold J. Singer, president.

LEONARD A. FRIEDMAN

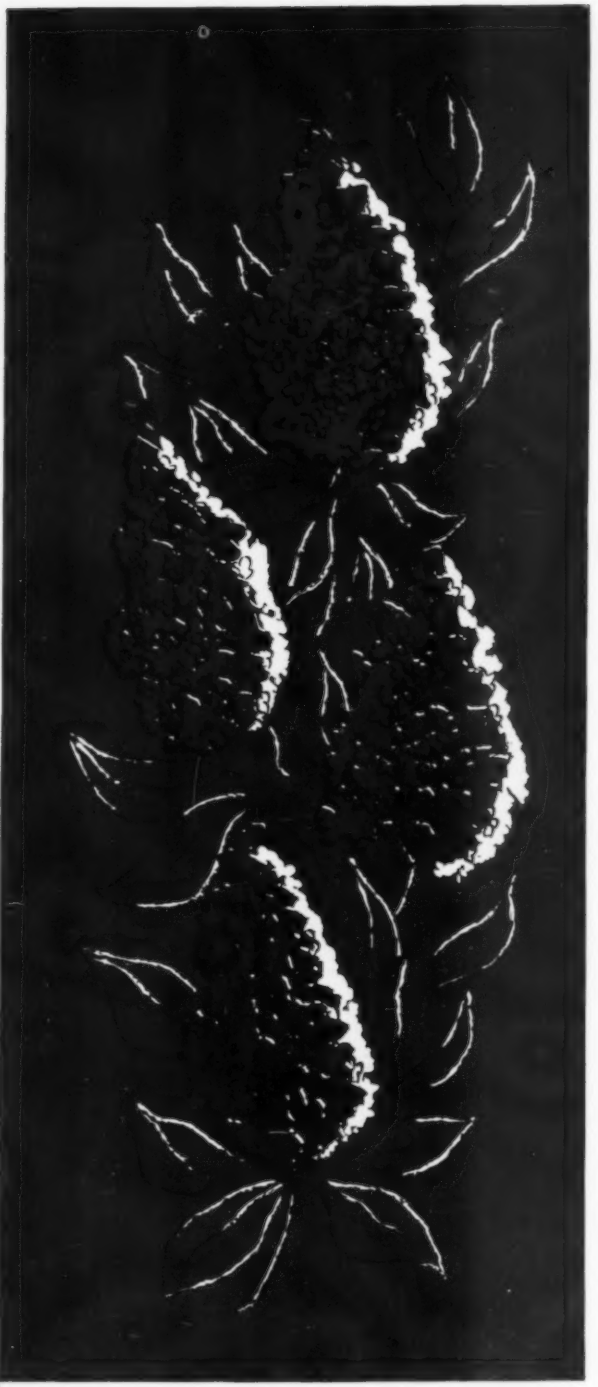
Fogarty Heads Cont. Can

Thomas C. Fogarty, formerly executive vice-president of the metal division, has been elected president of Continental Can Co., succeeding Hans A. Eggerss who has retired.

Reuben L. Perin, vice-president of the eastern metal division, has been elected executive vice-president, succeeding Mr. Fogarty.

Members of White Laboratories' Quarter Century Club attending recent festivities and induction ceremonies. Left to right, seated: Elsie Jordan, H. R. Webb, Ann Rafferty, F. G. Mindnich, Florence Daniels, G. J. Radler, Ellen Corcoran, M. Melchione, Mary Froehling. Middle Row: H. G. Boyer, W. E. G. Huggett, W. J. Schultz, Martha Kuhlewein, F. T. Quinn, Bernardine Drake, K. A. Bartlett, Helen Stachnik, H. G. Foster. Top Row: N. E. Smith, W. E. Cummin, H. E. Willer, J. E. Murhpy, O. A. Gabrielsen, J. J. Feldmann, J. C. DeCesare, M. J. Scheerer, W. R. Cassell, L. B. Pinkerton, T. C. Curtiss.

The World-Famed Lilacs Bloom Again



Heiko Perfume and Cosmetic Compounds are once more available to fine perfumers.

Heine and Company has again begun to produce the quality specialties so highly prized and widely known for their unsurpassed excellence the world over.

Heine and Company is resuming full production. Mr. Frederick C. Keidel, long distinguished in the field, will be Chief Perfumer, assisted by a staff of competent perfumers and chemists. Mr. Chester Tompkins will be in charge of sales.

Now you may order superb:

Heiko-Lilac "A"
Oil of Lilac known around the world as an indispensable base for modern perfumes with the natural odor of fresh flowers.

Heiko-Jasminette White
Most widely used in cosmetic compositions.

Heiko-Pink
Respected for its retentive power, and highly recommended for all carnation compositions.

Your welcome inquiries for samples of all inimitable Heiko flower products, aromatic chemicals, and essential oils will receive our interested, prompt attention. Please let us help you meet your finest quality requirements in every detail.

HEINE & Co
601 W. 26th St., New York 1, N. Y.

TRADE HEIKO MARK

JOSEPH DAFFNER

Daffner, V.P., Norex Labs.

Joseph Daffner has been appointed vice-president of Norex Laboratories, Inc., according to R. Blayne McCurry, president of Norex and Schenley Laboratories. He has been national sales manager of Norex for the last three years and will continue in that capacity.

Givaudan Visits U. S.

Andre Givaudan recently paid his semi-annual visit to the United States. He visited his many friends in the industry and discussed topics of current and mutual interest encountered both in this country and abroad.

He returned to Paris and Geneva in late October.

Norda Buys Heine & Co.

Norda Essential Oil & Chemical Co. has purchased all the American assets of Heine & Co., manufacturer of perfume and cosmetic compounds. Heine originated in Leipzig, Germany, and began its operations in the United States in 1905.

Under the Trading with the Enemy Act, the United States Government Alien Property Custodian seized the firm in 1946.

Frederick C Keidel will again be chief perfumer of Heine, assisted by a staff of perfumers and chemists. Chester Tompkins is in charge of sales.

The firm will be located at 601 West 26th St., New York 1.

Dragoco Rep. Visits U.S.

Carl-Heinz Gerberding, of Dragoco, Gerberding & Co., Germany, one of Europe's leading producers of compounds and essential oils, left the United States late last month following a three-day visit. While in this country, he toured various factories and essential oil houses in order to become better acquainted with American production and merchandising methods.

LOUIS M. TIMBLIN

Louis M. Timblin

Louis McFarland Timblin, treasurer and a director of Chas. Pfizer Co., Inc., died at Mather Memorial Hospital, Port Jefferson, N. Y., on November 20 following a heart attack. He was 56 years old. He joined the company in 1940 as auditor and later became assistant treasurer. He was appointed treasurer in 1945.

A member of the executive committee of the Pfizer Board of Directors, Mr. Timblin was also chairman of the company's Grants Committee and treasurer of the Pfizer Foundation.

He is survived by his widow, Irene; and two sisters, Mrs. Martha VacVean and Mrs. Agnes Tomlinson.

Prince Gourielli

Prince Artchil Gourielli Tchkonia, husband of Mme. Helena Rubinstein, died November 21 at the age of 60. They were married in 1938, a year after he came to New York. Born in Tiflis, Russia, he was a descendant, through the female line, of the last ruler of the independent principality of Gouria, Georgia, Russia.

He is survived, in addition to his wife, by a sister, Princess Maria Chavchavadze, and a niece, both in France.

Claude A. Hanford

Claude A. Hanford, 56, president of Pharmaco, Inc., a subsidiary of White Laboratories, died at Georgetown University Hospital on November 3 following heart surgery. He had been ill for about a year.

In 1930 he joined Health Products Corp. which subsequently became White Laboratories. When Pharmaco was formed in 1941 he was elected vice-president in charge of sales, and president in 1949.

Surviving are his wife, Mrs. Florence R. Hanford; his father, Charles; and a brother, Arnold.

A. Theodore Anderson

A. Theodore Anderson, assistant sales manager of the container and accessory division of Kimble Glass Co., died November 12 at Albany, N. Y., following a stroke he suffered on a business trip. He was manager of Kimble's sales branch in New York from 1950 to 1955 and moved to Toledo last march.

Mr. Anderson is survived by his wife.

A. R. Clark

A. R. Clark, founder and president of the Texas Pharmacal Co., died on October 5. The board of directors has elected the following officers who will conduct the business under the same policies as before: L. W. Schleuse, president; Rayford W Clark, vice-president; Katherine H Netting, secretary; and Marian Ashley, treasurer.

Dr. Arthur F. St. Andre

Dr. Arthur F. St. Andre, senior research chemist at Ciba Pharmaceutical Products Inc., died on October 24 of a heart attack. He was 41 years old.

He joined the staff of the chemical research division at Ciba in 1941 where, for a number of years, he carried out investigations in the field of steroid hormones and also reserpine and other Rauwolfia alkaloids.

Surviving are his wife, Eileene; a son, Arthur; two daughters, Carolyn and Michelle; his parents, Mr. and Mrs. Arthur St. Andre; a brother, J. Roland; and two sisters, Mrs. William Kramer and Mrs. Edward Poglis.

Frederic Rosengarten

Frederic Rosengarten, retired board chairman of Merck & Co., died October 28 in Chestnut Hill Hospital, Philadelphia. He was 78 years old.

He entered Rosengarten & Son in 1905, in which year the company acquired the Powers-Wightman firm of pharmaceutical chemists. Mr. Rosengarten became vice-president of the new concern, the Powers-Wightman-Rosengarten Company, which in 1927 was merged with Merck & Co. He then became chairman of the board, retiring in 1950, though continuing as a director. He was considered an authority on the manufacture of narcotics.

Surviving are his widow, the former Marion Sims; a son, Frederic, Jr.; a daughter, Mrs. Morris W. Stroud; a brother, Joseph G. Rosengarten, Jr., and six grandchildren.

Distinctive oval Sterane tablets are produced on a Stokes tablet machine at Chas. Pfizer & Co., Inc. Tooling for these tablets was made by Stokes on a fast production schedule to meet the product's introduction date.

Pfizer Sterane* promises new hope to arthritics

New drug marketed in distinctive oval tablets produced on Stokes machines

Sterane, the powerful new anti-arthritic and anti-inflammatory steroid recently announced by Chas. Pfizer & Co., Inc., of Brooklyn, N.Y., is said to be three to five times more potent than cortisone. Another important advantage to the new drug is its relative freedom from side effects found in previous corticoids used in the treatment of rheumatoid diseases.

Pfizer markets this new pharmaceutical in novel oval tablets which are embossed with the Pfizer trademark. Special punches and dies were developed by Stokes, working in conjunction with Pfizer production personnel. The oval shape has a practical purpose as well, since scored tablets in this shape are more easily broken by arthritic patients when taking small doses.

**Trademark of Chas. Pfizer & Co., Inc.*

Stokes pharmaceutical equipment is used to slug Sterane, granulate it and compact the drug into its final oval shape. This equipment is also used in the production of other pharmaceutical products sold under the well-known Pfizer label, including Bonamine*, a motion-sickness drug, Tetracyn*, a broad-spectrum antibiotic, and many other tabletted products.

From punches and dies to complete plant layout and equipment, Stokes' experience can help solve your pharmaceutical production problems. Write for your free copy of Catalog 601, describing the complete line of Stokes Pharmaceutical Equipment.

F. J. STOKES MACHINE COMPANY, PHILADELPHIA 20, PA.

OFFICES IN PRINCIPAL CITIES, REPRESENTATIVES THROUGHOUT THE WORLD

STOKES

Management Forum

by Francis Chilson
INDUSTRIAL CONSULTANT

Management Functions

Many management set-ups are inadequate and in some cases illogical because top management does not always seem to have a clear understanding of the basic divisions of management. When these are clearly understood an organization chart delineating the interrelationship of these several divisions means something. It must be admitted of course that sometimes an organization is lopsided because of sentiment. Usually this comes about from the fact that some old officer, who is too old to demote or to fire, is holding down two dissimilar posts. In spite of all that is said about hard-headed American business men, they do pay fortunes for sentiment and will refuse to divide up the responsibilities of an old retainer, simply because they don't wish to hurt his feelings, particularly when he has but a few years to go before reaching retirement age.

As I see it the following divisions of management are basic and never should be combined unless an organization is too small to afford a full complement of executives:

Production. All sorts of jobs are grouped wrongly under production. I've known export to be under production supervision and even research.

Procurement. In some organizations purchasing or procurement is listed under production even though the purchasing officer is required to buy advertising materials and supplies and office equipment as well. In some instances the procurement officer may be forced to make long term market commitments in which case purchasing becomes a financial function.

Inventory Management. This is a relatively new term and a new function in many organizations. It has to do with the control and management of all inventories wherever they may be located. In some cases this function is exercised by the production control department; in others by the traffic department; in still others by the sales department.

Finance. In some organizations the finance officer is also the controller; in some he is also responsible for inventories and purchasing.

Distribution. In most organizations distribution is partially under sales and partially under production. In other firms distribution is controlled by the traffic department. This phase of our activities is coming in for a lot more study than it has had in the past. Not merely is there a question of inventory management involved but even more important is the problem of sales service. And not by any means last is the problem of steadily increasing freight and trucking rates.

Marketing. This is a broad spectrum function since it includes the organization and management of markets; the selection and training of salesmen; the selection and control of advertising media and methods; market research and sales promotion.

Records. In this area all matters relating to accounting, statistics, archives, legal problems and office management are lumped together. But in some companies the legal department is set apart as a staff function responsible directly to the president or general manager.

Personnel. One never knows to whom the personnel manager is likely to report. In some cases his boss is the plant manager, in others he reports to the president as a staff officer.

Public Relations. Since corporations have been legally defined as *persons* with all the rights and responsibilities of individuals, it follows that among these responsibilities is the responsibility of being a good citizen. As a consequence more attention is being paid to public relations as an independent staff function. In many firms this function is still regarded as part of the job of advertising. That I think is a mistake.

Research. In most organizations in our industries research is fairly well organized as a staff function

A. H. Krogg

. . . for 37 years in charge of all granulation and compression operations at

STRONG-COBB COMPANY, INC.

comments:

"In our business, versatility is the factor which governs the success of our operation. Therefore, when we choose high-speed production equipment, geared in capacity to our constantly expanding production schedules, we have to think, also, of its versatility—the ease and economy with which it can be changed over from one job to another with minimum down time."

It is significant that the highly-efficent Strong-Cobb plant in Cleveland, one of the best-known high-production plants in the country, has one of the largest Colton installations.

If you need high production with versatility in tableting, we invite your inquiry.

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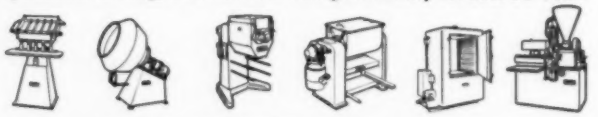

TABLET COUNTERS | COATING STANDS | GRANULATORS | MIXERS | OVENS | MULTI-TUBE FILLERS

The NEW Installations are COLTON

responsible to the president. In a few firms research is responsible to production and that certainly is a mistake.

Quality Control. This responsibility is sometimes controlled by research which is a mistake; sometimes by production which is worse. Control should report to a senior officer—a vice president in charge of operations or to the general manager.

Having considered carefully the nature of each separate responsibility an organization pattern can be worked out and charted for convenience. An organization chart or pattern is meaningless unless it is carried out. Therefore the following rules are pertinent:

Make sure your organization structure is adequate, comprehensible and simple. Don't try to put a Rolls Royce engine on a Jeep chassis. Just because General Motors follows certain management and organization practices is no reason for you to assume that such practices will work as well for you. Nevertheless General Motors should be studied.

Define the scope and responsibilities of each key post in your organization. This should be done in writing and the area of authority should be known to everybody.

Don't fail to delegate full authority along with responsibility. Most organizations fail because men are given responsibilities but no real authority to exercise them.

It must be anticipated that key men will sometimes, being human, make mistakes in exercising authority or in failing to do so at the right time. Remember always, Mr. President, you've made plenty of mistakes yourself.

Never undermine subordinates by going over their heads or slighting them in any way. Never criticize subordinates in the presence of their own subordinates.

Never listen to criticism of one subordinate by another unless the criticism is made in the presence of both subordinates.

Never criticize one subordinate to another of equal rank. If criticism is justified criticize the subordinate or criticize the subordinate to his superior.

Always remember that an organization is only a team of which the several key members are not of equal capacity—physical, mental or moral. To keep the team pulling evenly some men will need an occasional cut of the whip; others always require a check rein and some need a frequent word of praise. It is not easy to create a good organization and to staff it is harder still, but the biggest job of all is to operate it effectively. The effectiveness of an organization is often impaired, not through the normal exercise of its functions, but through jealousies, pettiness, moodiness and particularly vindictiveness. A man who is by nature vindictive is always easily irritated or offended and he will spend a lot of his mental energy and time trying to devise ways of getting revenge. I would never recommend a vindictive man for a key post in any organization. When I am called upon to revamp an organization I never hesitate to recommend the elimination of a man who is obviously vindictive regardless of the importance of his post.

Quick Sales Analysis

In order to get quickly day to day sales figures one of my clients considers as sold everything delivered to the order picking section of the shipping room. At the end of the year the stuff remaining in the order picking area is inventoried and the books adjusted accordingly. In this case of course orders are never picked from the principal, palletized stocks but always from the order picking area, to which replenishment supplies are delivered in standard loads or pallets.

Projection Charts

I have said repeatedly that to compare one's performance against previous sales records is insufficient because there is no way of accurately judging whether the compared performance is greater or less than it could have been. Most sales forecasts are made by adding a percentage to previous sales totals. But no one knows whether those totals are what they could have been. I have long advocated charting the future for at least ten years ahead and then to use that yardstick or projection chart as a measure of current performance. It is not easy to prepare a sound projection chart. It must be done on an actuarial basis, as it is done by the insurance companies, whose very existence depends upon the accuracy of their long range forecasts. Their rates are based on forecasts and not upon the amount of business they did last year. Procter and Gamble are reputed to use projection charts and to have been remarkably accurate in their forecasts.

As I am neither an actuary nor a statistician I cannot tell you how to prepare a projection chart. We know that the pharmaceutical industry is affected by population trends; it is affected by marriages, births and deaths and the incidence of disease. It also is affected by divorces, accidents and the number of people reaching retirement age. The veterinary and biological people are directly affected by the price of beef and hogs and the populations of pets, particularly dogs and cats. The price of rent and living costs, the scale of employment, the fluctuation in savings, dividend payments, commodity prices, carloadings, the prices of industrial stocks and the number of business failures and new incorporations. You can compare your previous figures with one or more of these indices, and if you go back far enough, you will inevitably find a ratio or relationship between the fluctuation in your business and the indices you have chosen.

One of the more important indices is of course the performance of your own industry on which you can get detailed comparative figures from your own broker or the Federal Securities Exchange Commission. When you have established a base I would suggest that you appeal for help to your own insurance com-

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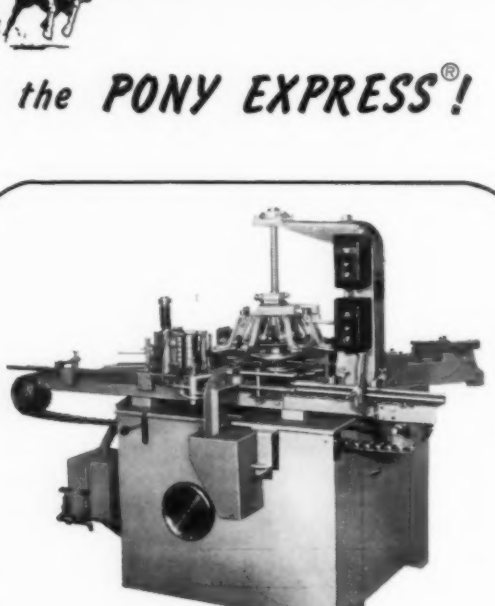
STEP UP YOUR LABELING...*with the* PONY EXPRESS®!

STEP UP from HAND-FEED LABELING

If you use a semi-automatic labeler now for the sake of flexibility, change to fully automatic on the PONY EXPRESS and have the same flexibility, plus 50% more production, without the cost of a full-time operator.

STEP UP from an 'automatic' that is not FULLY automatic

No machine is "fully automatic" unless it does uniform work without the cost of extra labor to inspect the labeling job, reposition the label, wipe off glue smears, or press down the corners of the label. It is "semi-automatic" if you need someone to complete the machine's job.



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Less demand as to the limits within which the glue consistency must be maintained, plus the micro glue-control that prevents applying an excessive amount of glue to the label, guarantees clean results and precise label registration with which to achieve the desirable maximum display appeal.

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pany's actuarial department and also to the National Bureau of Economic Research.

A simple way to make a projection chart is of course to draw a straight curve from where you are now to where you want to be ten years hence. But an arbitrary chart like that is too empirical and impossible to sell to your sales force. If however the chart is based on carefully evaluated data you will have little difficulty in selling the idea to your sales force. Once they accept it as reasonable you've got both a guide and a whip in your hand. What you did last year is unimportant; what you do this and next year is what really counts.

Christmas Carol

I'll never forget the time Uncle Dave Whitlock was selected to be Santa Claus for our annual school party. We used to have a play every year on Christmas Eve and the year I am telling you about, I was in it. I suppose my part was the "heavy lead" or whatever you call it, because when I heard Santa Claus' sleigh bells ringing, I was supposed to stand by the chimney and holler, "Whoa Vixen! Whoa Blitzen!" The chimney—"chimbley" we kids used to call it, was built around one of the schoolhouse windows with boards and two-by-fours, and our teacher, Miss Duffy, covered it all over with red paper that was printed to look like bricks. The bottom of the chimney was cut away so that it would look like a fireplace. Santa Claus was supposed to climb in through the school house window and down the chimney into the school room and distribute the presents in his big bag.

The reason Uncle Dave was elected to be Santa Claus was, that he had a pair of fawn colored road horses that we used to call "buckskins" but nowadays would be called Palominos. The plan was that Uncle Dave would fasten deer antlers to the horse's head stalls and would come galloping up to the schoolhouse in his slick new cutter that looked almost exactly like Santa Claus' sled except it was black. But nobody paid any mind to that. Anyway the kids were to sing "Jingle Bells" when they heard him coming, and when he pulled up outside the schoolhouse I was to start hollering "Whoa Donner! Whoa Blitzen! Whoa Vixen!" I had an important part in that play.

It was a beautiful night that night in 1910 when we had the play or whatever you might call it. Clear and cold and crisp and the moonlight was so bright you could easily read a book by it.

Uncle Dave got himself rigged out in the Santa Claus outfit Ma made for him. She made him a long white beard and she gave him a couple of sofa pillows to tuck inside his belt to pad him out because Uncle Dave was kind of skinny. So when Uncle Dave got himself all fixed up, he didn't come straight to the schoolhouse as Ma told him to; he stopped at the Half Way House and had himself a few slugs of "rot-gut" as Ma used to call all kinds of whiskey.

Everything was all set in the schoolhouse. We had a big Christmas tree that Dick Martin and I cut over beyond Smeader's Pond and we had to drag it all the way across the ice. It was decorated with candles and colored pop corn strings and tinsel and candy canes and all kinds of stuff. It really looked swell.

The schoolhouse was full of people. Most everybody around was there. And the oblong cast iron box stove was red hot because the night was cold. Pa and Ma were there and my sister Mary. Pa was all slicked up like everybody else. He was wearing a light colored cutaway coat (we used to call them Prince Alberts) and he had his grey moustache all trimmed up. He really looked fine and Ma looked pretty too. Everybody looked expectant, waiting to hear the bells of Uncle Dave's sleigh, because that was the signal for everything to begin. Us kids who were in the play were all rigged out in costume. I was one of the Magi and I had on a white turban that Ma made out of one of her white cotton stockings. Folks began to get a little fidgety because Uncle Dave was supposed to show up quicker than he did. He was in fact quite a bit late on account of stopping at the Half Way house to have a few slugs of whiskey.

But there was no mistake about it when we heard him coming. You could have heard those bells for twenty miles. Uncle Dave was standing up in the cutter hooting and hollering, with his white whiskers streaming in the wind and those horses were going so fast that Uncle Dave missed the schoolhouse altogether and was clean down to the South Road before he realized his mistake. Then he turned around and came jingling back. I looked out the window and saw him coming up. The steam was going up three feet over the horses' packs and the antlers had slipped their moorings and hung down over the horses' faces. They were the damndest looking reindeer I ever did see.

The kids in the play all started singing Jingle Bells, but I could not remember the other damn reindeer's name. All I could remember was Whoa Blitzen! Whoa Blitzen. So I kept hollering Whoa Blitzen! fit to kill, until Miss Duffy, who seemed to be a bit annoyed about something, whispered to me fiercely, "For land's sake Chilson! Shut up!"

In the meantime Uncle Dave climbed up the ladder and into the chimney opening which was made by lowering the top window. If he hadn't stopped at the Half Way House he would have known that with pillows stuck under his belt and that big bag of toys, he couldn't possibly have climbed down that narrow chimney without letting go of the bag and pulling it after him. Anyway he got stuck on the two-by-fours that supported the chimney and he started to swear. I heard him say "*goddam*," plain as day and most everybody in the schoolhouse did too because I looked down at Pa and he had his handkerchief over his face and his shoulders were shaking with laughter. Ma nudged him with her elbow and was looking at him

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fit to kill with her lips drawn tight as she was wont to do when she was really mad. I bet if she could have got ahold of Uncle Dave right then she'd have scalped him.

When Uncle Dave really began cursing in a hoarse mutter that everybody could hear as plain as day, Dominie Todd, who had been acting as a sort of master of ceremonies, and Miss Duffy reached up in the chimney and tried to pull Uncle Dave out. Uncle Dave, thinking it was us kids who were yanking at him, says, "Leggo me, you little sonsabitches. You're pulling my pants off!"

You should have heard everybody laugh. Everybody but Ma. She was as mad as a wet hen and if it hadn't been in public I think she would have whacked Pa because he was laughing so much.

Miss Duffy's face was as red as a spanked baby's bottom. Dominie Todd's eyes bulged, and he looked like he was trying to pull his bald head down into his three chins. For a minute he looked like a redfaced turtle.

Pretty soon Uncle Dave came unstuck and landed at the bottom of the fireplace. "Goddamn!" he said. His white whiskers had come unstuck on one side and my little sister Mary hollered right out loud, "That aint Santa Claus! That's Uncle Dave!" I could have killed her.

But pretty soon everything got squared away and Uncle Dave got his whiskers stuck back and we had the play and the presents around the tree and the Christmas carols. The next day Uncle Dave came over to our house feeling a bit contrite. At first Ma wouldn't talk to him but pretty soon she loosened up and wished him Merry Christmas and kissed him and said she might have known he'd disgrace the family.

The Industrial Council

The Industrial Council which convened at Rensselaer Polytechnic Institute on October 27-29th marked a milestone in the history of this industry in that for the first time top level management men from the proprietary and the ethical sections of the industry met together to discuss with each other and with the teachers assembled the various aspect of the industry in which they are jointly engaged.

Teachers came from secondary high schools in every part of the country. They asked a lot of intelligent questions. From the panels I attended it appeared that we and the teachers have two parallel problems. We need more scientists; therefore we must have more science students, and the time to interest kids in science is while they still are in secondary schools. On the other hand we need more science teachers. The startling and dangerous fact was brought out, that last year over 200 high schools had to drop chemistry and physics from their curricula because teachers in these subjects were not available.

The teachers all want more money and seem to feel that this is the solution to the teaching problem. The teachers seemed to recognize it is their problem to interest kids in science; but they do not seem to realize it also is their problem to interest kids in teaching. I do not recall a single instance in grammar school, high school and college where a teacher ever gave a talk on the vital importance of teaching as a profession or the spiritual satisfaction that comes from guiding and training the young. I have always regarded teaching as the most exalted of the professions. It seems obvious that we must have more good teachers before we can have more good scientists but if the teachers aren't sufficiently interested in the great importance of their own profession to proselyte for it, I don't see how the need for teachers can be met.

Vial Filling and Capping

The Arenco Machine Co., Inc., 25 West 43rd Street, New York 36, N. Y., has taken over the American sales and service of the Schubert & Co. of Copenhagen, Denmark Capsolut capping and sealing machines. These machines are used for affixing aluminum seals with rubber gaskets. They are both automatic and semi-automatic sealing machines.

Manesty "DryCota" Combined Tablet Making and Compression Coating Machine

This revolutionary machine for compressing and coating tablets continuously is now being used by several works for general production, and by others in experimental work on new developments. Orders have been received from eleven countries and repeat orders have now come in. We can therefore claim that the machine has proved itself.

The machines now being made have been fitted with some special features which ensure that every tablet produced incorporates a core.

The mechanism consists of two operating fingers mounted on each side of the transfer unit. The front finger is set so that the head of the plug in the transfer arm passes over the finger during normal running, but in the unlikely event of a centre failing to be deposited into the transfer arm, the head of the plunger remains down, and as it travels round it strikes the finger which operates a micro switch. This instantly energizes the solenoid and throws the gate on the chute over to the rejection position; at the same time, the power to the motor is switched off and the machine comes to rest. A warning light on top of the control panel will attract the attention of the operator if away from the machine. It is also a reminder that the solenoid is still energized, and this should be switched off as early as possible after the flywheels on the machine have come to rest, unless the machine is going to be re-started immediately, in which case it is only necessary to press the machine start button.

The rear finger performs a similar function, but this safeguards against the centre sticking in the transfer cup and thereby failing to fall into the coating die. If a centre fails to fall, the transfer plug remains up, and as it travels round it wipes the rear finger, which

again operates another micro switch. This in turn starts up the sequence previously described.

Both switches are fitted in dustproof boxes and the operating spindles mounted in oil-impregnated bushes. The front finger is so arranged that it can be hinged clear if it is required to use the coating machine only.

The control panel is mounted in a steel cabinet with built-in start and stop push buttons for both the machine and dust extractor unit. It also includes ammeter, warning light, switch for solenoid and isolator. The circuit is so arranged that, before starting the machine, the solenoid has to be switched on: this puts the gate on the chute in the rejection position. After pressing the machine start button, the solenoid automatically cuts out after the machine reaches speed and the gate goes over to the normal position. This prevents centres that may have been in the dies for a long period mixing with the good tablets.

On stopping the machine, either by push botton or the micro switches, the gate immediately goes to the rejection position, the warning light comes on and the motor is switched off.

After the flywheels have come to rest, the solenoid should be switched off. The dust extractor unit is independent to the machine motor and can be used when cleaning down the machine.

Automatic Cap Sealer

Alfred Hofmann & Co. states that H & K's new automatic cap sealer is one answer to the problem that has plagued the chemical and pharmaceutical industry since the introduction of aluminum seals.

The company illustrates the point by discussing the machine now in operation at the New Brunswick plant of E. R. Squibb & Sons. Designed for six differently sized and shaped vials, this capping machine seals curled under aluminum caps at speeds variable from 60 to 130 per minute. From the rotary accumulator table the containers are conveyed single file into the star wheel which brings them to the capping station, and finally discharged onto an off-conveyor for subsequent operations. The aluminum caps are loaded in bulk into a mechanical hopper, emerge through the feed chute and are picked off by the vial with perfectly synchronized movement.

Simple and swift adjustments are all that is required to follow varying height specifications. Finger tip control of rails and tracks adjusts to a wide range of diameter variations, and exchange of star wheels completes rapidly the set-up for a new production cycle.

The machine is of a sturdy welded steel construction, mounted on rubber tired casters revolving 360°, and may be immobilized for line operation. The body of the unit is finished in baked enamel and all parts above deck are chrome plated. The movement of the various stations is controlled by a Geneva drive, transferred through precision tapered gears and cans, made easily accessible by removable front and back panels.

The basic advantage of the RRD III unit is that it can be tailored to any given specification in container and/or cap size for fast, safe, dependable sealing.

New Conical Laboratory Spray Dryer

Bowen Engineering, Inc., 13 Station Road, North Branch, New Jersey, announces a new spray dryer, compactly designed for laboratory and small lot production work. This new dryer, which has greater drying capacity than the popular Bowen Table Model Spray Dryer, features a conical bottom drying chamber. The dryer also offers a choice of either nozzle atomization or centrifugal atomization or both.

The dryer is especially suited for drying operations on heat-sensitive materials. Total treatment time is just a few seconds from the time the solution or slurry is fed to the atomizer where it is forced into a whirling vortex in the drying chamber, until the dry solids are deposited in the Pyrex product receiver. Special patented air inlets in the drying chamber side-wall permit shock-cooling of ultra heat-sensitive materials.

The Bowen Conical Laboratory Spray Dryer incorporates an automatic temperature and flame-failure safety system. Two dial type thermometers are furnished as standard equipment. Insulated stainless steel construction is used wherever the product comes in intimate contact with the dryer. The new unit is built to withstand the most rugged service, and is designed for rapid disassembly and easy cleaning.

The Bowen Conical Laboratory Spray Dryer has a drying air rate of 250 cfm. Heat loads of up to 230,000 btu/hr are possible with an evaporation rate of up to 80 lbs/hr.

Optional equipment includes pneumatic opening device for the drying chamber, automatically controlled electric heater and air turbine driven centrifugal spray machine.

This unit will be on display at the Chemical Show in Philadelphia on December 5-9, 1955.

Lilly Laboratories Cited

The Tippecanoe Laboratories of Eli Lilly and Company have been cited by *Factory Management and Maintenance* magazine as one of the ten most significant manufacturing plants completed in the country in 1954.

Five hundred plants in the United States were considered for the awards. The $20,000,000 Lilly plant was designed especially for the manufacture of penicillin and other antibiotics.

The Lilly Laboratories were selected as one of the nation's ten best because they are a prime example of long-range industrial planning. The fourteen-building plant was constructed with plenty of power for continuous service in the production of vital drugs. In the event of an electrical feeder system breakdown, a second electrical feeder can take over in thirty seconds.

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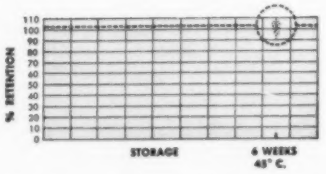
A. THREE TYPES. Roche makes three types of riboflavin, each of which has special advantages for pharmaceutical manufacturers.

- **RIBOFLAVIN 'ROCHE'—REGULAR.** Especially useful for powdered dietary supplements, pharmaceutical tablets, soft gelatin capsules and dry enrichment premixes.
- **RIBOFLAVIN 'ROCHE'—SOLUTIONS TYPE.** For use in parenteral solutions which approach or slightly exceed the maximum solubility of B_2. Less likely to crystallize out.
- **RIBOFLAVIN-5'-PHOSPHATE SODIUM 'ROCHE'.** An original Roche development. Preferred for all solutions because it is rapidly and highly soluble. Better taste . . . no bitter after taste. Eliminates need for solubilizers. Specially valuable for highly concentrated oral and parenteral multivitamin solutions (with or without ascorbic acid), elixirs, syrups, water dispersible multivitamin formulations in capsules, tablets, lozenges. Theoretical B_2 content: 73%. Roche product: 70-73%.



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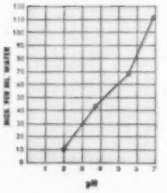

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Advancing Therapy

Salk Polio Vaccine

Preliminary studies of this year's polio rates indicate that the Salk vaccine may be even more effective than originally expected. At the Ann Arbor ceremony last April 12, the vaccine was proclaimed 80 to 90 per cent effective against paralytic polio. Since then between 15 and 18 million children have been vaccinated but the supply has been so low that most got only one shot, which produces minimum immunity. Even so, the Salk vaccine has been about 75 per cent effective against paralytic polio.

The report was presented by P. H. S. leading medical intelligence officer, Dr. Alexander Langmuir, at the annual meeting of the American Public Health Association. Dr. Langmuir told a group of health officers:

The rate of paralytic polio was from two to well over five times greater in unvaccinated than in vaccinated children;

There was "substantially and significantly" less paralytic polio among 7- and 8-year-olds than in the past;

Since mid-May when P. H. S. safety standards were tightened, between 11 and 14 million injections have been given and there has been no evidence that any of them caused polio.

The upshot of the reports was a renewal of last April's optimism about the vaccine's future. Scientists and health officials now figure that paralytic polio may be greatly reduced by next summer if enough vaccine is made available.

The Cutter incident had the effect of slowing down production. Safety testing was increased. The technical committee of experts was appointed to supervise release of all vaccine; the committee demanded not only that each lot pass all the tests but also that each manufacturer demonstrate consistency of performance. The technical committee released a comprehensive report which stated that "manufacturing difficulties have been identified and corrective measures have been taken."

The result is expected to be not only increased safety but also more vaccine.

Secondly, in the confusion of last summer there was talk of a "new vaccine" in the offing. As a result, some of the manufacturers were reluctant to increase their production. The talk has now ended; P. H. S. believes the vaccine has proved itself.

Oral Penicillin

There is a trend toward oral penicillin therapy according to W. P. Boger (*J. Am. Geriatric Soc.* 3:556, 1955), now that penicillin is far less expensive and far more potent on a milligram basis than it was when penicillin was first investigated.

Oral penicillin is reliable; a penicillemia of variable duration has been demonstrated in all of the author's patients given an oral dose of 100,000 units or more. The amounts of buffering substances ordinarily incorporated with penicillin will not neutralize any significant quantity of acid. Maximal absorption of oral penicillin is favored if the patient is in the fasting or near-fasting condition. Insoluble penicillins offer no advantage over ordinary potassium penicillin G for oral administration. Hypoallergenic penicillins, such as penicillin O, are useful when administered parenterally to some penicillin-sensitive patients, but are not recommended for oral administration. Penicillin V (phenoxymethyl penicillin) has recently been reported to have the properties of insolubility, stability in the presence of acid, and better diffusion from the gastrointestinal tract into the circulation. Plasma penicillin concentrations following orally administered penicillin are enhanced two to four times if probenecid is given with the penicillin. The usefulness of oral penicillin will be tremendously extended if a penicillin can be produced that contains a deterrent to renal tubule secretion; p-amino benzyl penicillin has this property, in the laboratory at least. The type of penicillin and the size of the dose are important factors in determining the size of the oral dose required to produce a penicillemia obtainable with a given amount of intramuscular penicillin.

Filipin Antifungal Antibiotic

Filipin, a potent antifungal agent, has been isolated by G. B. Whitfield et al, of Upjohn Co. (*J.A.C.S.* 77:4799, 1955) from the mycelium and culture filtrates of a previously unreported actinomycete, *Streptomyces filipinensis*, found in a sample of Philippine soil. Crystalline filipin is a yellow, neutral compound whose analysis corresponds to an empirical formula of $C_{30}H_{50}O_{10}$. The absence of nitrogen, sulfur and halogens, together with the high oxygen-to-carbon ratio makes filipin an extremely interesting metabolite. Filipin is non-aromatic and is unsaturated, taking up approximately four moles of hydrogen with either platinum oxide catalyst or three per cent palladium on carbon catalyst.

In common with other polyenes, filipin is susceptible to autoxidation and particularly so when exposed to light. Thus, solid filipin preparations lose activity in air in clear glass bottles, but not under nitrogen even when exposed to direct sunlight. Filipin is stable in the dark in air at refrigerator temperatures. It is relatively stable in very dilute solutions in ethanol (50 mcg. per ml.) but is unstable at 10 mg. per ml. under all conditions tested. Filipin deteriorates slowly in aqueous methanolic solutions at pH 2 and at pH 11. Filipin is very soluble in dimethylformamide and pyridine. It is soluble in 95 per cent ethanol, methanol, *n*-butanol, isopropyl alcohol, *t*-butyl alcohol, glacial acetic acid, ether, ethyl acetate and amyl acetate. It is nearly insoluble in water, chloroform, 50 per cent ethanol, methylene chloride and Skellysolve B.

Viadril Anesthetic

Viadril, the first steroid anesthetic used successfully in man, has become the favorite agent for all head and neck surgery, a group of physicians reported to the annual meeting of the American Society of Anesthesiologists in Boston.

The physicians, Drs. Frank J. Murphy, Neri P. Guadagni and Francis L. De Bon of the department of Anesthesiology of the University of California School of Medicine in San Francisco, administered Viadril in 300 surgical operations, including all kinds of abdominal, intra-thoracic, neurosurgical and orthopedic procedures.

Dr. Murphy pointed out that of prime importance is Viadril's lack of respiratory depression as compared to thiopental, when combined with a narcotic supplement to achieve an equivalent depth of anesthesia.

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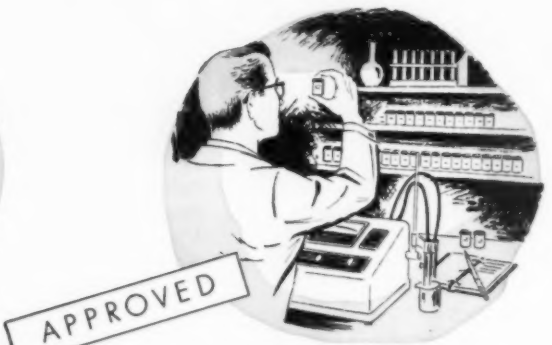

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BY PRODUCTION:

"With Merck's capacity to supply, we can really plan tight production schedules. And Merck B_{12} is so uniform, we get along fine with quality control."

BY SALES:

"Merck showed us how to improve our B_{12} product to boost consumer acceptance. Besides, we like the way Merck stimulates professional appreciation of all vitamin products through special promotion."

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The next most desirable characteristic of Viadril, according to the clinician, is its almost selective ability to dull the reflexes of the pharynx and larynx.

Viadril also exhibits a chlorpromazine-like property that enhances the effect of opiates and gas anesthetics. This synergistic property greatly reduces the dose of opiates, curare and gas anesthetics required.

Mineral Nutrition

In the opinion of Dr. Russell Couch, professor of poultry husbandry and biochemistry and nutrition at Texas Agricultural and Mechanical College, far more attention has been paid to vitamins than to minerals in animal and human nutrition. This opinion is based on his discovery of last year that combinations of minerals have a remarkable effect in stimulating growth, a discovery confirmed this year at Cornell.

Dr. Couch experimented with distillers' dried solubles. When these were added to a basal diet for chicks which contained adequate amounts of amino acids, vitamins and minerals known to be necessary an increased rate of growth was noted, an increase that amounted to 32 per cent. When the distillers' dried solubles were burned to ash and an identical amount of the ash added to the same diet, a growth increase of 17 per cent was noted.

The distillers' dried solubles were analyzed with the spectroscope and their composition thus determined. A commercial chemical equivalent of the ash was then tested. The growth response was about the same as that obtained by feeding the ash.

The strange fact emerged that when each of the chemicals found in the ash is added singly to the diet of chicks there is no response in growth. It is the mixture, the balanced combination that stimulates growth.

This finding should have a profound effect on the thinking of nutritionists. It looks as if the proper combinations of minerals may be as important as vitamins in the development of both animals and human beings.

Sintrom Anticoagulant

The new coumarin preparation, Sintrom (3 - nitrophenylacetylethyl - 4 - oxycoumarin), takes an intermediate position between the coumarin preparations that have a prolonged effect and those that have a short action. S. Moeschlin and H. Schorno (*Schweiz. med. Woch.* 85:590, 1955) have used it in 50 patients for the treatment of thrombosis, pulmonary embolism, and cardiac infarct, and to prevent thrombosis after operations or trauma. The drug is tasteless and is willingly taken in water or tea. The prothrombin level increases within 24 hours and subsides to the initial values in from 48 to 72 hours. Therefore it is comparatively easy to adjust to the optimal prothrombin level without a too protracted time of recuperation, which can be further reduced by the administration of vitamin K_1. The new drug has practical advantages over other anticoagulants and is of great value in internal, surgical, and gynecologic conditions. No undesirable secondary effects were observed, even during prolonged treatment of up to six months.

Analgesic Potency

R. D. Gibson, T. S. Miya and L. D. Edwards (*J. Am. Pharm. Assoc. Sci. Ed.* 44:605, 1955) describe a procedure for the evaluation of analgesics in rats which depends upon the squeak response to graded electrical stimulus. Analgesic efficacy seems to parallel peak blood salicylate levels after oral administration of the drug. The minimal effective doses and their relative analgesic potencies as compared to acetylsalicylic acid are as follows: acetylsalicylic acid, 450 mg./Kg., 1.0; acetophenetidin, 750 mg./Kg., 0.6; sodium salicylate, 600 mg./Kg., 0.75; aminopyrine, 450 mg./Kg., 1.0; sodium acetylsalicylate, 150 mg./Kg. (dose calculated on the basis of acetylsalicylic acid), 3.0; acetanilid, 150 mg./Kg., 3.0; salicylamide, 75 mg./Kg., 6.0; antipyrine, 75 mg./Kg., 6.0; all administered orally, and morphine sulfate, subcutaneously, 5 mg./Kg., 90.

Cycloserine

The effectiveness of cycloserine has been established by Drs. Michael G. Mulinos, Ruth Strang, Linn J. Boyd, Morton Schwimmer, Lois Lillick and Israel G. Epstein.

The group declared that the drug, produced by a mold Streptomyces orchidaceus, had now been tested for more than seventeen months in 750 patients and had been found effective against respiratory infections, tuberculosis, skin and intestinal infections and other diseases.

As a result of their clinical experience with cycloserine, they said, it might be necessary to restudy many antibiotics that have been discarded as worthless after animal tests, since cycloserine had not shown up well in standard screening techniques.

Gout Treatment

Twenty-seven patients with 51 attacks of acute gout were treated by F. Koller (*Schweiz. med. Woch.* 85:693, 1955) with Irgapyrin, a proprietary pyrazolidin containing equal parts of phenylbutazone and aminopyrine, and with phenylbutazone. A complete remission resulted within 48 hours in 42 attacks; Irgapyrin was given in 27 of these attacks and phenylbutazone in 15. Because of their rapid and reliable effect, Irgapyrine and phenylbutazone are superior to colchicine and corticotropin in acute attacks of gout. Phenylbutazone enhances the excretion of uric acid and thus produces a pronounced decrease of the serum level of uric acid. Undesirable side-effects such as a tendency to retention of sodium chloride and water, leukopenia, and agranulocytosis are of minor importance in the course of the short-term treatment of the acute attack of gout. In chronic tophaceous gout, probenecid is the drug of choice.

Diethylamine Salicylate

A cream containing diethylamine salicylate 10 per cent in a vanishing-cream base has been used by T. H. Howell for the relief of soft tissue rheumatic pains (*Brit. J. Phys. Med.* 198:62, 1955). Results in a controlled series of 24 patients suffering from chronic rheumatoid arthritis or osteoarthritis indicated that 19 patients received relief from pain, compared with six patients who received a dummy cream.

Aspirin for Arthritis

Aspirin remains the most effective and best tolerated therapeutic agent in treating early stages of rheumatoid arthritis, according to Dr. Thurman Crawford (*Memphis Medical Journal* Sept. 1955).

Noting that salicylates are still the principal form of treatment, he points out that gold and hormonal compounds should be confined to "more resistant and severe cases.

While various combinations and dosages of salicylates are prescribed for the condition, Dr. Crawford terms aspirin as probably the best tolerated and most readily available. Daily intake of the analgesic varies with most patients, but a total of 80 grains of aspirin—16 tablets— in a 24-hour period should be adequate to relieve mild to moderate stiffness and swelling in a few joints.

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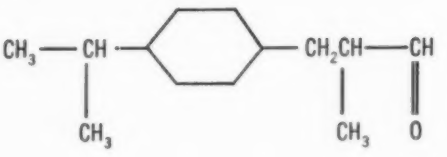

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Compounder's Corner

Evaluating Hair Waving

In his U. S. Patent 2,719,813, J. W. Haefele of Procter and Gamble gives useful information on the testing of cold wave preparations which is being reproduced here because of its general interest.

Curl diameter, expressed as Deficiency in Tightness, D.I.T., is measured in the following manner. A strand of 12 human hairs 4.25 inches in length and cemented at each end is wet-wound on a mandrel 6.5 mm. in diameter, then saturated for a given time at 100°F. with the waving solution. After the wound strand has been exposed to the solution for the desired time, the solution is rinsed from the strand which is then treated with a solution of the neutralizer for three minutes to fix the curl. The hair is again rinsed, removed from the mandrel and while wet is allowed to assume a circular curl which is measured for average diameter. The formula applied is

$$\text{D.I.T.} = \frac{\text{diameterofcurl in mm.} - \text{diameter of mandrel in mm.}}{\text{diameter of mandrel in m.m.}} \times 100$$

The lower the D.I.T. value, the higher the effectiveness of the wave solution, the range being from 0 to 100.

When the formed curls are suspended by one end they show a certain amount of springiness depending upon the efficiency of the waving operation and limpness related to the damage caused by the solution. The curl length is thus a measure of hair damage and ordinarily ranges from 45 to 100 mm., the higher the value the greater the damage.

Another measure of hair damage is the so-called "20 Per Cent Index." An instrument records the stretch of keratin-containing fibers by the application of a uniformly increasing load; the ratio of the load required after treatment to the load required before treatment to stretch the wet strand 20 per cent of the original length is the desired index. The lower the figure, the greater the damage and values can range from 0 to 1.0.

These individual values should be tied together to obtain a single over-all figure for the so-called curl value. This is done by dividing the ranges mentioned above into ten equal parts, assigning the proper class values to the experiment and adding these values. Thus, for an ideal curl value, the curl length will lie between 45 and 54 mm. (class value 1), the D.I.T. will be between 0 and 9 for a class value of 1 and the 20 per cent index will lie between 0.9 and 1.0 again class 1. The curl value will be 3 to show minimum curl length, no deficiency in tightness and no hair damage as measured by the 20 per cent index. For maximum hair damage and minimum curling action, the figure will be 30. For an intermediate good example, the curl length will be 62, in class 3, the D.I.T. will be 15 in class 2 and the 20 per cent index will be 72, in class 3 for a curl value of 8. This method of evaluation should be of great laboratory value since it permits the relatively objective evaluation of solutions, time of action, neutralizers on different types of hair at different times. A possible improvement is possible in a different weighting of the three factors other than on the equal basis used, but this can arise from correlation of laboratory data with actual results of consumer application. These numerical values also make it possible to utilize modern statistical experimental design to get more nearly trustworthy results from less extensive data.

Antacid Evaluation

Nine *in vitro* methods commonly used to evaluate antacids were compared by R. E. Booth and J. K. Dale of the Upjohn Co. (*J. Am. Pharm. Assoc. Sci. Ed.* 44:694, 1955) on several types of antacids. No direct correlation could be made to reduce all the methods to a common denominator. The effects on results due to changes in temperature and stirring rate were investigated. These changes may be characteristic of the antacid as well as the method. Reproducibility studies show the need for several runs to obtain a valid evaluation. The data presented substantiate the thesis that promotional literature for antacid products should be based on a standardized method. A comparison of various antacids by a particular method gives useful information. However, further work needs to be done to find a standardized method suitable for all types of antacids.

Comment: The U.S.P. acid-neutralizing capacity test for antacid ingredients determines the amount of standard hydrochloric that will be neutralized to a given p H value by a known weight of the compound. For the rest, it is not especially difficult for a chemist to devise a test that will make his particular mixture look superior and provide a hook for promotional effort. Most of the important questions are not ordinarily answered by in vitro studies—will the antacid preparation tend to cause alkalosis or acidosis, will it cause diarrhea or constipation, at what p H value does "heartburn" or pain set in and where does it stop for patients with and without ulcers? In vitro studies are surely necessary to provide an inexpensive guide to formulation, but results obtained will not have the force of fundamental laws of nature.

Filtering Bacteria from Oils

By means of alternating vacuum and gravity filtration, corn oil was passed continuously by K. E. Avis and L. Gershenfeld of the Philadelphia College of Pharmacy and Science (*J. Am. Pharm. Assoc. Sci. Ed.* 44:682, 1955) through a series of filters for a period of 84 days. The filters employed included unglazed porcelain candles, diatomaceous earth candles, an asbestos filter, and a sintered glass filter. Physical tests of filter effectiveness, i.e., flow rates and bubbling pressure determinations, were performed before and after the prolonged period of corn oil filtration. Filter effectiveness, as determined by sterility tests on filtrates from saline and from corn oil suspensions of *B. cereus* spores and *S. marsescens* were also performed before and after the prolonged period of corn oil filtration. Additional short period filtrations were performed to corroborate the results obtained from the prolonged filtration.

The results from the sterility tests on the filtrates suggest that the diatomaceous earth candles are less effective in retaining all *B. cereus* spores and *S. marsescens* from suspensions in both corn oil and saline when the candles are

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New Derivatives for Evaluation in Shampoos

Two detergents, sulfated tridecyl alcohol derivatives, which show promise as shampoo ingredients, have recently been developed by Atlas research, and are being offered to cosmetic and pharmaceutical formulators for evaluation. Both are anionic foaming products. Tests indicate they are non-irritating to the eyes at concentrations of 10% or less active ingredients. They are pale yellow liquids, soluble in hard and soft water and in dilute acid or alkaline solutions. They are approximately neutral in pH at 1% concentration.

The two products are Atlas G-2842 (sodium salt derivative) and G-2843 (ammonium salt derivative), in 27.5% active aqueous solutions.

G-2842 and G-2843 are available in limited commercial quantities. Write to Atlas for descriptive bulletins, samples, prices.

used for the filtration of corn oil. The effectiveness of unglazed porcelain candles for the filtration of corn oil to obtain a sterile filtrate is not dependable with organisms such as *S. marsescens*.

The findings from this preliminary study suggest that certain filters are less effective following corn oil filtration. Further investigation is indicated.

Hair Waving Patents

U. S. Patents 2,719,813 and 2,719,814 issued to J. W. Haefele and U. S. Patent 2,719,815 issued to J. H. Sanders on October 4, 1955 and assigned to Procter & Gamble Company all deal with the addition of a certain proportion of disulfide to the alkaline mercaptan hair waving solution to reduce hair damage without undesirably affecting the waving process.

The first patent protects the use of water-soluble hydroxy- and/or alkoxy-substituted non-tertiary mercaptans along with a related disulfide; the second patent covers mercapto-carboxylic or mercapto-sulfonic acids and disulfides; the third patent is devoted to the use of mixtures of thioglycolic acid with dithioglycolic acid.

In general, the patents claim the use of aqueous solutions substantially free from sulfite and organic thiosulfate containing from one to 15 per cent of the mercaptans at pH values ranging from 8.5 to 10.0, the molar ratio of disulfide to mercaptan being from 0.10:1 to 1.5:1. The specific claims are for a mixture of thioglycolic and dithioglycolic acids in the molar ratio of 0.25:1 to 0.8:1, the thioglycolic acid concentration being about five per cent and the pH 9 to 9.5.

U. S. Patent 2,717,228 issued to A. E. Brown on September 6, 1955 and assigned to The Gillette Company covers cold wave solutions containing a thiol (ammonium thioglycolate, cysteine, mercaptoethanesulfonic acid or 3-mercapto-2-hydroxypropanesulfonic acid), urea (or methyl- or ethylurea) and an ammonium salt of a strong mineral acid (ammonium chloride or ammonium sulfate). Generally, the solution will have a pH of 8.6 to 9.4 and contain 0.4 to 0.6 moles of the thiol, 0.5 to 3.0 moles of urea and 0.5 to 1.5 moles of the ammonium salt. The invention is based upon the discovery that the swelling of the hair caused by the urea increases the waving activity of the thiol, the ammonium salt being added to modify the swelling without reducing the waving action.

Sugar Coating Tablets

The following procedure is said to produce evenly coated tablets which disintegrate in a reasonable time. With skilled operators, the time taken to apply the coating can be reduced, but an average time for the following would be about sixteen hours for the simultaneous coating, in four pans, of 100,000 tablets per pan.

The tablets, before being placed in the pan, are carefully sifted to remove dust, broken tablets, and pieces of foreign matter. A sub-coating solution consisting of:—1½ oz. gelatin dissolved in 16 fluid oz. of water and added to a solution of 20 lb. of sugar in a gallon of water, is prepared and maintained at a temperature just below boiling point.

Next: 14 fluid oz. of this mixture are slowly poured on to the tablets rotating in the pan and when evenly distributed and the tablets are slightly "tacky," 3 lb. of Kaolin is distributed over the batch. The powder will be taken up on the tablet surface and a slight excess will remain in the bottom of the pan. A draught of cold air is directed on to the batch and the tablets are well dried. About ten minutes should suffice before the second application. This procedure is repeated three or four times, the amount of Kaolin applied being adjusted so that the tablets, on drying, have a smooth shiny surface.

The next stage is the addition of a "bulking" syrup, which enables relatively large quantities of syrup to be applied without the tablets sliding in the bottom of the pan, which would occur if large quantities of simple syrup alone were used. The bulking syrup consists of:—Wheat flour, or starh—c 2¼ lb., Calc. Carb. precipitated—1¼ lb., mixed to a smooth paste with 1 gallon of hot syrup.

This bulking syrup is applied in quantities of one pint per pan, and when the tablets are rolling freely and are well covered with the syrup, a draught of hot air is used to dry the tablets. This is repeated until the weight of the tablets is about 4.9 grains.

If white tablets are required, the coating is continued with applications of four to six fluid oz. of simple syrup until the tablets are smooth and well covered. The tablets should now weigh about 5.4 grains.

To prepare for the polishing process, the last 0.1 grain of coating is dried with a cold air draught, and the final two or three applications are allowed to dry without the aid of an air draught. After the final application of syrup, the rotation of the pan is stopped before crystallization of sugar is apparent on the tablet surface; the opening of the pan is covered, and the pan is rotated through half a revolution at five minute intervals,

If at any time during the coating it is observed that tablets have stuck together, or broken up, or that small pieces of sugar have broken away from the side of the pan and are sticking to the tablet surface, causing irregular shapes, the tablets should be removed from the pan, sifted, and replaced only after the pan has been washed out and the irregular shaped tablets removed.

Tablets should stand about two hours before being transferred to the wax-lined polishing pan. The tablets are polished by rotation in the pan for about twenty minutes. Small quantities of alcohol / chloroform mixture are sprinkled on to the batch to attain a highly polished surface. Alternatively, a solution of beexwax/carnauba wax in petroleum ether may be applied.

For colored tablets, a colored syrup is employed and the above procedure followed. The initial applications of color syrup should be diluted to insure an even color on the finished tablets.—*Chem. Prod.* 18:374, 1955.

Calcium Methionate

A soluble, stable, relatively nontoxic, well-tolerated form of calcium, which could be administered orally and parenterally would be a significant addition to the medical armamentarium. Preliminary investigation by Jenkins indicated the calcium salt of methylene disulfonic acid (methionic acid) to be the most promising of a series of calcium sulfonates. A study was designed by G. V. Rossi, T. S. Miya and L. D. Edwards (*Am. Pharm. Assoc. 102nd meeting, 1955*) to evaluate further the potentialities of calcium methionate and compare its pharmacological actions, irritancy, acute toxicity, effect of prolonged administration, rate of absorption, and hypercalcemic effect with extensively investigated calcium compounds.

In comparison to calcium gluconate, calcium methionate has certain advantages from the pharmaceutical manufacturer's viewpoint, including an almost 50 per cent higher calcium content, greatly increased water solubility, and elimination of the need for stabilizers. Considering the clinician's interests, it offers a potential therapeutic usefulness parallel to calcium gluconate.

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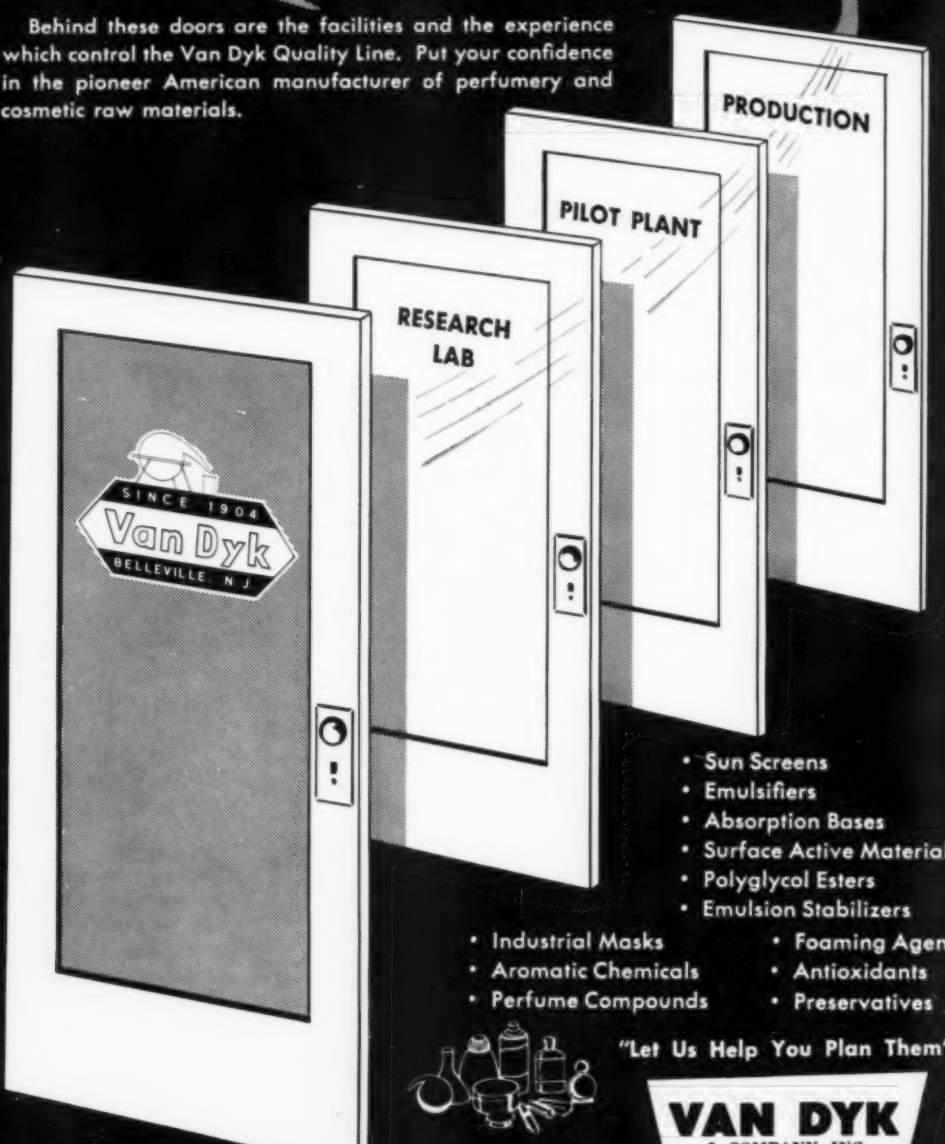

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Skin Research

The Passage of Medicinal Substances Through the Skin

Guillot and Valette have made an extensive survey of the literature concerning absorption by the skin and this paper was published in Techn. Pharm. in French. Because there is much in this survey of general interest, I have translated this long article and it will be reproduced in serial fashion in this department.

The passage of different substances through the human skin can take place by various mechanisms. Oversimplification, which interprets the results as due to the permeability of a dialyzing membrane, is, from all the evidence, unacceptable. It is necessary, actually, to realize that several paths of penetration exist: either by way of the sudoriferous glands and by the hair follicles (through the sebum which fills the cul-de-sac), on the one hand, or by the cornified layer of the epidermis, whose surface layers, at any rate, act as if they consist of superimposed inert membranes separated by a layer of air. Indeed, after these obstacles have been passed, the substance must traverse the deep layers of the epidermis and dermis, that is, a tissue of living cells justaposed one on the other, without spacing. The phenomena of percutaneous permeability will, consequently, be interpretable as phenomena of membrane permeability only to the extent where they occur either through the crossing of the cornified layer of the epidermis (inert membrane), or the deep layers (living membranes formed in reality at the interface of two immiscible aqueous media or, more exactly, of an aqueous medium and a gel).

Here are the several mechanisms that can enter:

a) *Filtration* through a coarsely porous membrane; *dialysis* across a membrane which allows the passage of molecules and ions of small dimensions and stops colloids and macromolecules; *semipermeable membrane* stopping molecules of large dimensions and allowing the passage only of the very small ones; finally, a membrane permitting the passage only of water.

b) In the case where all parts of the membrane are not in equilibrium, the phenomena are complicated:

1. If there is acid-basic disequilibrium, there is a difference of potential from one part to the other, which can play a selective part with respect to the ions of positive or negative charge, the ions with multiple charge being more influenced than ions with a simple charge (Girard's phenomenon).

2. There is oxidation-reduction disequilibrium in the case where the membrane shows selective properties for chemical or mechanical reasons, a difference in potential is also established that is compensated by an exchange of electrons (Becquerel's phenomenon).

3. In the case where proteins are found on one side of the membrane, and not on the other, their adsorption ability for mineral ions may bring about an electrical dissymetry having consequences analogous to the preceding ones, that is, causing a concentration of ions (Donnan's phenomenon).

4. A difference of chemical composition from one part to the other of a semipermeable membrane may provoke adsorption of monomolecular film of certain ions or substances on the face of the membrane. If the adsorbed substance is polar, it is oriented, and the film corresponds to an electrical double layer.

c) The chemical structure of the membrane also plays a part in facilitating the dissolution in its mass of certain substances to the exclusion of others, which facilitates their passage.

d) The hydrophilic character of the membrane is indeed an important factor, certain ions or molecules having their passage facilitated in a porous milieu whose walls are covered with molecules of water, while this circumstance prevents the passage of other substances.

The name "electrophysiologic barrier" has been given to a "stop membrane" which is localized at the surface of the first living cells under the cornified part of the epidermis, or stratum corneum. This cornified part is formed of dead cells. Living cells in the depth of the epidermis and in the dermis, have a surface with a negative electric charge because of their normal metabolic activity. It is because of this permanent electrical layer that the skin can repel certain ions. This "electrophysiologic barrier" then is the first factor determining the percutaneous permeability of medicaments.

The second factor is the existence of hair follicles: they constitute, roughly, pits pierced through the skin and filled with a fat which is a mixture of lipids and steroids whose solubilities determine selective permeability.

The third factor is the permeability to organic substances of the whole skin and especially the cornified parts of the epidermis.

Omitting the sweat glands and the hair follicles, considering only the epidermal coating which makes up the cornified layer, we can consider the skin to be the following system: protein membranes insoluble in water but susceptible to inbibition by it, are superimposed one upon the other, connected at certain points that may be regarded as zones of support, and separated one from the other between these points by air spaces. This is thus a stratified system. A complex mixture of lipid substances impregnates this ensemble. It is probable, moreover, that certain of these lipids are in part fixed to the proteins making up the membranes; in all cases, these lipids appear different in their composition from those which form the sebum. When a liquid is spread on the surface of such an ensemble, the following phenomena may be expected:

1. What will be the role of the fatty substance which impregnates the epidermis? According to the nature of the liquid, this substance can, if it is insoluble in the liquid, constitute an impermeable barrier; if it is soluble, it will disappear. In the intermediate case, where it is slightly soluble, but surface active, it can pass slowly into solution to be adsorbed at the surface of the liquid.

2. It is certain, in any case, that the quality of this fatty substance existing at the surface of the skin, or perhaps the nature of the lipids which form it,

varies notably from one region of the epidermis to the other. Moreover, the thickness of the cornified layer is itself very variable. Now, experiments show that imbibition by immersion in water is easier where the layer is thicker (finger, toe, nails, etc.); when it is thin, the wettability of the epidermis by water remains zero or very small, even after prolongd immersion, and even after washing (arms and shoulders, for example).

Application of an organic substance which can diffuse rapidly in the lipoproteins which make up the membranes of the dead cells of the cornified layer shows an effect similar to that which has been utilized for protective purposes. When porous paper bags are sewed together one inside the other so that a sufficiently large number are superimposed (a minimum of four or five), and a drop of organic compound is placed on the ensemble, there is diffusion and spreading on the first layer of paper, but the amount that completely penetrates is relatively small. This small proportion then works on the second layer and again so little penetrates that nothing at all will go through the third paper layer. This same stopping process occurs with skin layers and accounts for the fact that a series of individually porous layers will stop the passage of liquids and vapors.

In the case of the skin, the interpretation of wetting phenomena is very difficult. A product which wets the epidermis has a tendency to spread in an infinitely thin layer. In the case where the product is volatile, this behavior accelerates volatilization in air and thus diminishes the chances of penetration, but, at the same time, it increases also the surface of contact with the skin and the chances of penetration. Wetting is not only a function of the surface tension of the liquid on solution, but also, of its magnitude and also of the surface tension of the skin and, actually of the skin-liquid interfacial tension. Now these two last physical magnitudes are extremely difficult to measure and cannot be measured in current physiological practice. Their order of magnitude and, consequently, their real importance are thus unknown. Here again it is only experiment which can tell us to what extent a product will wet the skin.

The ability of a solid surface covered with fatty substance to be wet by water is not merely a function of the nature of the surface and of the nature of the fatty substance being spread but also of the manner of spreading of the substance. The same oil, for example, on a glass surface, will wet perfectly or not at all according to the process utilized for spreading the film (Guillot). Phenomena of the same type are produced when fats are spread on the skin and this explains the contradictory results obtained by Schneider and Schuleit.

This question of the role of wettability and the associated problems of surface tension and interfacial tension is often considered from the point of view of penetration across the skin not of the surface active substance itself that is dissolved in the water, but of a medicinal substance associated with it. The wetting agents have, indeed, the reputation of facilitating the penetration of dissolved substances: this is too short a view. A surface active substance forms an adsorption film at the water-air interface, but we cannot know a priori if it will form one of the same nature at the water-skin interface; again it is experiment alone which can decide in each particular case and a priori knowledge of the physical properties of the wetting agent will not alone suffice to permit predicting behavior of a given dissolved substance with respect to penetration.

From these considerations, we can draw only this somewhat deceiving conclusion: it is experiment alone, for each substance, which will permit establishing of rules of behavior. In other words, there is no simple way of visualizing the problems by examining them from a physical point of view nor a complex way by examining them from a physiological point of view. Rather than simple physical systems, the problems passed to the physician are already of almost infinite complexity. This is especially true in the case where the solution in contact with the skin contains a mixture of dissolved substances, and the difficulty arises from the fact that what can be established experimentally on a certain area of human skin can not necessarily be generalized for the whole body surface of the same individual. We must expect to find notable differences in behavior from one skin to another and still greater differences between man and animal.

Melanin

Natural melanin from human hair and various synthetically produced melanins were examined by B. Schmidli (*Helv. Chim. Acta* 38:1078, 1955) chromatographically, spectrophotometrically and with the electron microscope. Natural melanin obtained by present methods was shown to be a mixture of pigments with melano-protein. A protein-free melanin of greater solubility and more color intensity was obtained by treating hair with a saturated solution of sodium sulfide at 50° C. This dissolved the decomposition products of keratin, leaving the bulk of the melanin as a black, oily residue. Extraction of the residue with normal sodium hydroxide, or heating with dilute hydrochloric acid, gave chromatographically homogeneous melanin. Diffusion measurements show it to have a molecular weight of about 70,000.

Topical Vitamin A

Although vitamin A in massive doses by mouth has been used for years, with fair success in dermatoses showing dryness and hyperkeratosis, its topical use has received relatively little attention. Reiss and Campbell (*Dermalogica*, 108: 121, 1954) have used a cream containing 3000 i.u. to the ounce, and have noted distinct improvement in ichthyosis, lichen pilaris and pityriasis tabescentium. Psoriasis was not improved.

Percutaneous Absorption of Mercuric Chloride

The skin of guinea pigs was treated by R. Wernsdorfer (*Klin. Wochschr.* 33:626, 1955) with radioactive mercury labeled mercuric chloride and the amount of absorption was determined after six to 16 hours by measuring the radioactivity of the heart, lungs, liver, kidneys and blood. No absorption was detected irrespective of whether the mercuric chloride was applied as an aqueous solution or incorporated into various salves or powders.

Selenium Disulfide Toxicity

According to the interpretation of the experimental data by E. M. Shapiro, C. M. Pomerat and J. F. Mullins (*J. Invest. Dermatol.* 24:423, 1955) there is no appreciable difference in the toxicity of Selsun as compared to the suspending vehicle alone. It must be remembered, however, that this method would determine only toxicity to the skin or primary irritation capacity. This study does not attempt to evaluate any allergic response or such toxic reactions which might occur in other organs if selenium disulfide penetrates the skin.

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Useful addition to present standard fixatives

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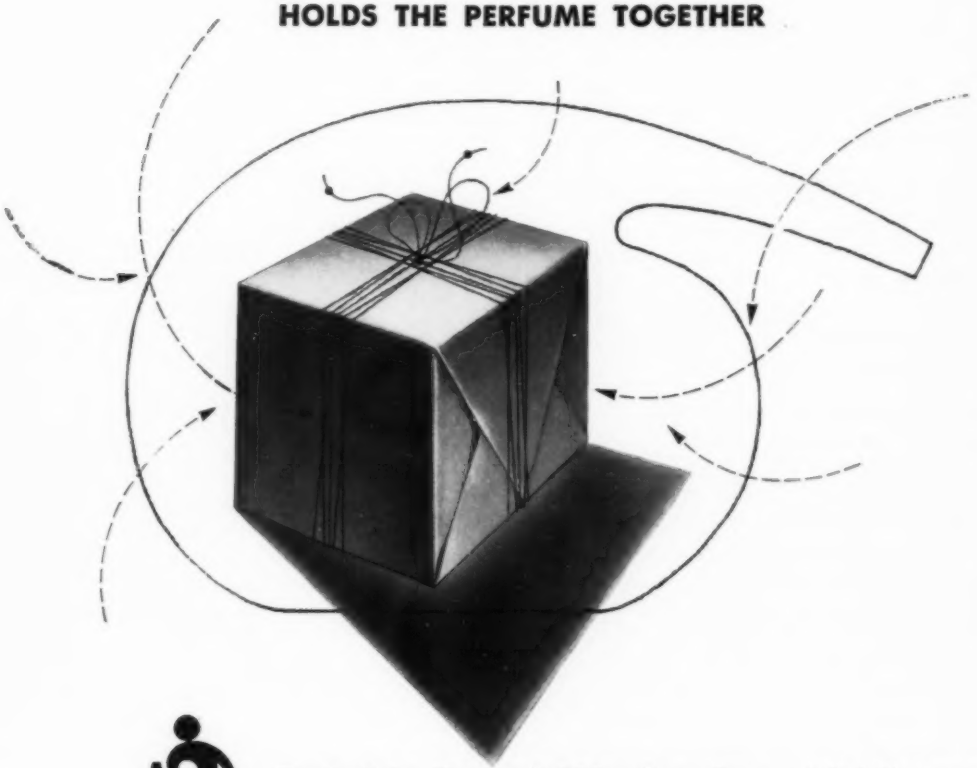

Polak's Frutal Works, Inc., Middletown, New York

*Domestic and Foreign Patents applied for.

(Continued from page 799)

In all of the above formulations the tyrothricin was first dissolved in propylene glycol. The glycerin then was added and finally the distilled water to make the elixir. The elixir was then combined with the other components of the formulation.

Formula No. 1 above was the control in a series of studies on hamsters to determine anti-caries effectiveness of the formulations set forth above.

The results of these tests showed formulation No. 2 to be the most effective dentifrice, producing a 25.6 per cent reduction in carious surfaces compared with the control. Formulation No. 3 did not produce a decrease in carious surfaces compared with the control.

It is apparent that the tyrothricin in the dentifrice including insoluble sodium polymetaphosphate is available to exercise an effectiveness in the reduction in hamster caries. The tyrothricin-dicalcium phosphate dentifrice was no more effective than the control.

Recent Patents

2,719,847—**Hoffmann-La Roche—Substituted 1-Benzyl-2-Methyl-Octahydroisoquinolines.**

2,719,848—**C. F. Geschickter et al—4-(Dimethylaminoethylamino)-6-Methoxy Quinoline.**

2,719,849—**Eli Lilly — β - (1, 2, 4 - Triazolyl - 3) - Alanine.**

2,719,850—**G. D. Searle—Basically Substituted 9-Carbazole-Carboxamides.**

2,719,851—**Upjohn—Pyrrolidyl-Alkyl Esters of 2, 6-Dimethyl-4-Propoxybenzoic Acids.**

2,719,855,7—**Upjohn—Steroids.**

2,720,481—**Merck—Bisulfite Addition Products of Aldehyde Derivatives of Cortisone and Hydrocortisone.**

2,720,482—**Merck—Stabilized Streptomycin Solutions.**

CLEANSING LOTIONS

(Continued from page 765)

and may stay at this thinner viscosity or may set up again on further standing. As far as I know this can only be determined by observation. There is one great danger however which must be checked against. This "overstirring" may also weaken the emulsion to the point where a separation may take place. The reason for this probably lies in a mechanical partial destruction of the miscible structure which accounts for the lowered viscosity but if torn down far enough would cause an instability. When one deals with emulsions however no absolute statements can be made and this method of arriving at a desired viscosity can be used in certain emulsions. Since each material used in or as part of such a system has its own properties it is difficult to arrive at a set of over all specifications. The safest method is by observation.

The detergent or foamy type of facial cleanser has been briefly referred to earlier in this article. The mechanics of its activity are entirely different from the oily type and it works in much the same way as a soap. There is an attempt, however, to eliminate the chief complaint of facial soaps and that is to lower the pH to a neutral or even a slightly acid pH. The choice of the active agent may therefore be made from a large group of available compounds which fit into this category. The choice must be further influenced by irritation properties as far as contact with the skin is concerned.

The choice seems to lie between anionic and nonionic detergents, or a mixture of the two. The anionics are thought of as the better foamers and the nonionic types as the less irritating. Here again there may be considerable overlapping since this does not mean that the most irritating nonionic detergent is less irritating then the least irritating anionic.

In addition there have appeared several of the amphoteric detergents of "Zwitterion" detergents which seem to be well thought of. Because of these amphoteric properties they theoretically should function well at any pH.

The foamy type of cleanser is used much as a soap-applied on the moistened face, massaged and then rinsed off. In this formulation the same methods may be used in the cream shampoos except that somewhat less of the active material is needed here than in the shampoos.

Whenever detergents are spoken of we would normally expect that the agent performing the better cleansing job is the superior. Ordinarily this would be true. The cosmetic cleansing picture must be qualified, however, since women expect a certain enhancement from a cosmetic product as well as the initial function it is supposed to serve. We now come to some contradictions as to what the term clean implies from a cosmetic standpoint. If the term were used as it is in the textile field it would imply the removal of all foreign matter from the fiber. If this same criterion were applied to cosmetic cleansers the skin after such a treatment would appear so altered that the woman using it would certainly complain about harshness, dryness and any number of defects because the detergent was doing what it really is supposed to do. Obviously the woman does not want her face to be cleaned as thoroughly as she thinks. It would seem that she wants some of the surface oil removed and all of the soil, but if her face is not to feel dry, certainly not all of the surface oils can be removed. What she would want, therefore, is a preparation that removes substances that she thinks should be removed and not other substances which she deems desirable.

The oily cleansing preparations, I believe, owe their popularity to one of the facets of this argument. By their use the superficial soil is largely removed—but after removal there is still a thin film of oil which is desirable. The foamy type of cleanser obviously would remove more of the surface matter but unless compen-

(Continued on page 842)

DOW PROPYLENE GLYCOL, U. S. P.

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DOW

Perfumer's Shelf

Spray Dried Flavors

With the completion of its new plant at Boonton, New Jersey, for the spray drying of a full line of flavors, Norda has entered this segment of the flavor industry.

Until the past few years dry flavors were prepared simply by drying liquid flavors, either natural or imitation, on the surface of a dry base such as cane sugar, corn sugar, starch, etc. This was often difficult to do, resulting many times in damp and sticky mixtures which caked badly. Very often the time necessary to dry a powder satisfactorily was so long that much of flavor evaporated. Again, many of the flavors used in powders, by being spread on the base as a very thin coating, were subjected to accelerated evaporation, oxidation, and rancidity, and the flavor life of the product was very short.

The introduction of spray drying solved all these difficulties. The time of drying was reduced very drastically. By the older procedure, drying took anywhere from ten minutes to an hour. In the spray dryer this time is reduced to a fraction of a second, and because the drying is practically instantaneous, there is very little loss of the flavor constituents—even those which are comparatively low-boiling. This rapid drying is accomplished by spraying the flavor solution, containing the base on which it is to be dried, into a large chamber through which a current of hot air is flowing. The minute droplets of the spray meet the current of hot air and are dried instantly.

Furthermore, the flavor solution contains a colloid which, in the drying operation, encloses the flavor in an infinitesimally thin colloidal layer. This layer, though extremely thin, protects the flavor in the same way that the peel of a fruit protects the flavor and freshness of the fruit. Evaporation and oxidation in the flavor powder are prevented by this protecting coating. Here is the great advantage of spray drying—the dried flavor is almost exactly the same as the flavor used. There is no appreciable loss. Also, when dried, the flavors have far longer life than mechanically dried flavors, because they are protected by the thin colloidal coating.

With its new equipment, Norda will produce, not only top quality flavors in large volumes, but a range of products not possible before this time—from the easily dried imitation flavors to the very difficult natural flavors and fruit juices.

It is of the best and most modern design, incorporating all the latest improvements and refinements, as well as some unique innovations of its own. One of these innovations is the indirect heating of the air by electric heat. Usually, the gases from burning oil are used, and there is always danger of contamination. In this new dryer, the air is first filtered and then heated by passing through electric heaters. About 5,000 cubic feet of air per minute are heated this way, to about 450° F. before going into the drying chamber.

The drying equipment is constructed entirely of polished stainless steel. The main drying chamber is 18 feet in diameter, and the capacity of the unit is approximately 375 pounds of powder per hour.

The operation of the dryer is almost completely automatic, requiring the very minimum of supervision and labor. By means of this automatic control of temperature, volume of air, spray size, and all other factors, it is possible to insure the perfect quality and complete uniformity of flavor powders.

The future possibilities of this spray dryer are practically unlimited for newer and better flavors. In the near future, Norda will be offering spray-dried genuine fruit flavors with a life of several years—and spray-dried fruit juices with flavor quality almost indistinguishable from the fresh juice, and shelf life far beyond anything known at present.

Norda will also offer the whole spray-dried powdered fruit, useful for many new and practically unheard-of applications in packaged food products. It is our expectation that not only will the flavor industry experience a revolutionary change, but other related industries will benefit by advances now being made in the use of spray-dried products.

Musk Seed Oil

Musk-seeds are the ripe seeds of mallow plant, *Hibiscus abelmoschus* L. They have been used in India since earliest times for incense and as an aphrodisiac. The oil from the seeds is a fixative for perfumes and farnesol, a constituent of the oil, has an odor resembling lily-of-the-valley. A. M. Burger, who has cultivated abelmusk plants in Angola (Portuguese West Africa) for the manufacture of musk-seed oil, sums up his experience in *Aetherische Oele, Riechstoffe, Parfumerien, Essenzen und Aromen.*

The abelmusk, which grows up to seven ft. high, has big yellow blossoms. After flowering green pods—up to four in. long—develop and later turn brownish-red, when they are ripe and burst open. The seeds, which also become dark brown when ripe, are kidney-shaped and have a diameter of about 0.1 in.

For the manufacture of the seed oil, the pods are cut off when they are still ereenish-red, dried in the shade and thrashed. The seeds are sifted from the chaff, and since they are not yet mature they are still white and have no smell.

The seeds should be soaked in water for a day and then distilled in dry steam. The distillation takes a few hours, and the oil obtained is yellow, has a specific gravity of 0.900 at 15° C., a refractive index of 1.490 at 20° C., and shows no optical rotation. The yield is 0.2 to 0.4 per cent of the weight of the dry seeds.

The smell is fatty, but if the oil is heated with a 10 per cent alcoholic solution of causti soda on a water bath for several hours, the fatty smell disappears and gives way to the characteristic musky odor. After another steam distillation, the oil gives an ester number of 190, which is equivalent to a farnesol content of about 75 per cent.

Rectified musk-seed oil is an ideal fixative for perfumes, but unfortunately it is at present so expensive that it can only be used for luxury perfumes.

Farnesol isolated from the oil has a smell resembling the scent of lily-of-the-valley. Though weak at first, the smell

IN its unpretentiousness, the laboratory shown above belies the real importance of its very special assignments for it is engaged in highly confidential work concerned exclusively with the delicate problems of pharmaceutical flavoring. It is no exaggeration, therefore, to say that many an important manufacturer in this field has a substantial stake in its findings. Indeed, there are scores of pharmaceutical and proprietary products on the market today that owe their fine palatability to custom-made flavors developed in this modestly appointed but skillfully directed Pharmaceutical Flavor Laboratory. Appearances can be—and often are—deceiving.

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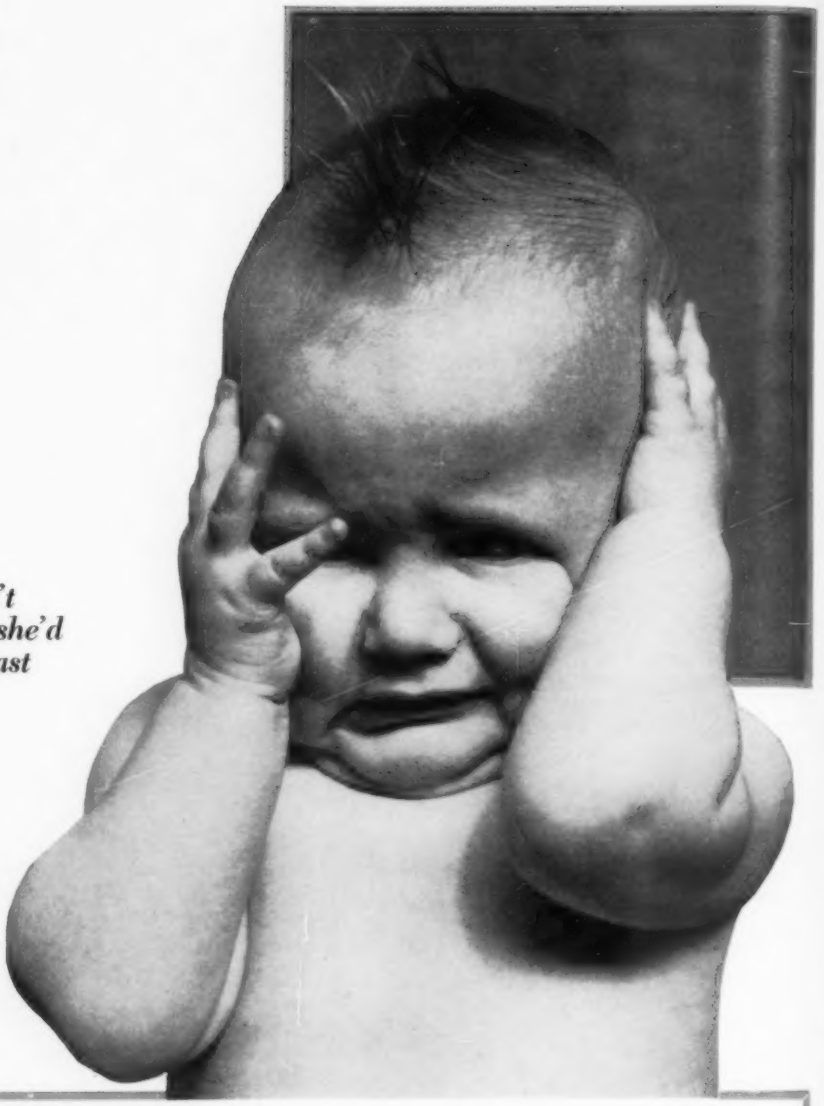
MAKES ME CRINGE TO THINK OF IT . . .



". . . and if mother weren't so patient and persuasive she'd never get that medicine past my lips again! It tastes just awful!"

SORRY, little man. . . . Chances are you're the victim of an old-fashioned doctor's shortsightedness—one who ought to know that tonics and medicines have changed and that, today, for every bad tasting medicine on the corner druggist's shelf there's a good tasting remedy you'd be happy to take. And not only are these newer pharmaceuticals and proprietaries good *medicinally*, they're good *psychologically*, for they pass sensitive palates *pleasantly* without the disturbing accompaniment of tautened muscles, twisted features and a small rebellion raging from within. . . . How has this medicinal metamorphosis been accomplished? Many of the large, ethical drug manufacturers have made the transition, logically and wisely, by placing their palatability problems squarely before firms such as ours, thus taking advantage of our years of applied and continuous research in the chemistry and scientific use of flavors. Without expending costly and sometimes fruitless time and effort themselves, they still benefit from the flavor expert's knowledge, experience and pre-eminence in his highly specialized field. We should like to suggest your doing likewise if you have similar problems to contend with.

For GOOD TASTE in Pharmaceuticals *Consult* . . . FRITZSCHE *Established* 1871

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becomes gradually more intense, and farnesol is therefore a good additive for artificial flower oils. Farnesyl acetate blends well with violet perfumes.

The finely ground musk-seeds themselves are used to make sachets, snuff and chewing tobacco.—*Manuf. Chem.*

Pharmaceutical Flavoring

Flavor cannot be referred to any one of the senses, but is rather a sensation of taste, smell and sight, all of which are integrated to give a perception of palatability. On the other hand individual preference is a factor to be considered, since, for example, it might be based upon an early association of a particular flavor with pleasant circumstances, unrelated to the nature of the flavor. Physical factors, imperceptible to sight or smell, also influence flavor—the oily "feel" of emulsion of mineral oil, for example, is dependent on the quality of the emulsion. For our purpose, drugs the taste of which need to be suitably masked may be classified into four main groups, namely: bitter, sweet, saline and acidic, although it is of interest to note that sensations such as astringent, dry, pungent, etc., are recognized.

In attempting to evaluate the efficiency of vehicles in disguising undesirable taste, the most complete investigations have been published by Wright and Purdum. From analyses of those experiments it was evident that cinnamon, licorice and orange flavors were generally best for masking saline drugs, while chocolate or raspberry syrup were preferable for bitter drugs. Raspberry syrup again and other fruit syrups were of value in overcoming the acidic taste of some drugs and volatile oils, either singly or admixed, were of value in emulsions of fixed oils.

The simple aromatic waters of the pharmacopeias still find wide use as flavoring agents; indeed, cinnamon water is the best masking agent for saline drugs.

Chocolate syrup, as evidence suggests, provides an excellent flavoring vehicle for bitter substances.

Syrup of raspberry produces an excellent flavoring medium, especially in the preparation of children's medicines. It may be prepared from the fresh juice or a dilution of a concentrate with the addition of sucrose and preservative. Generally speaking, the raspberry fruit juice concentrates, on dilution, do not impart a good color, but in flavor and palatability there is no distinction. Other concentrated fruit juices are available, which are relatively cheap, such as blackcurrant and strawberry juice. These again produce pleasantly flavored syrup bases. In proprietary medicines, however, synthetic flavors are finding much more use and indeed very palatable preparations can be prepared from these products.—D.Etchells, *Chem. and Drug.* 163:376, 1955.

Odor Classification

The assumption underlying work by R. W. Moncrieff (*Manuf. Chem.* 26:203, 1955) is that there are several kinds of receptors in the olfactory receptor system and that they will have different adsorbent powers towards different odorants, and that these differences will account for those differences in quality of odor that we observe. Some support for this view is found in the behavior of odorant materials towards four different adsorbents. Only a small number of odorants has yet been examined, but so far it does appear that their adsorption characteristics are unique. Furthermore those substances which have similar smells have fairly similar adsorption properties, whereas substances with very unlike smells have very unlike adsorption properties. So far, too, only a small number of adsorbent materials has been examined. Results have been given in this article for activated carbon, silica gel, activated alumina, and fuller's earth, all of which seem to be suitable for the purpose; two others which have been tried are punice and vegetable fat, and of these the former was too poor an adsorbent for many odorants to be very useful, and the action of vegetable fat may be one of solution rather than of adsorption. But although these two materials, pumice and vegetable fat, were not particularly suitable for defining odors, there is no reason to suppose that some of the other numerous adsorbent materials that are available may not be better than, or as good as, the four so far generally used. In particular, activated carbon is made in so many different qualities, varying in pore size, pore volume, and degree of oxidation, that it might well be possible to arrange an odor discriminatory system with varieties of activated carbon alone.

Probably the main virtues of this line of attack on the problem of defining odors are: it may be possible to characterize an odor by a set of numbers which have a real physical significance; it may throw light by analogy on the mechanism of olfactory stimulation.

Sucranilla

A new powdered vanilla product, based on natural vanilla extractives reinforced with aromatics and possessing unusual fixative values . . . Sucranilla is the newest development of the Dodge & Olcott, Inc., Flavor Laboratories. For shelf life testing, samples of Sucranilla were exposed in open containers to light, air, and temperature fluctuations during hot, humid weather for a period of more than two months, and retained their full aroma.

North African Bergamot

Bergamot oil from N. Africa studied by R. Schwob (*Ind. parfum.* 10:46, 1955) showed considerable differences in physical properties and ester-alcohol content. One sample of the Moroccan oil could be considered of commercial quality. The crucial difference was in alcohol content, where even the best sample was low. Ripe fruit gave an oil of higher ester-plus-alcohol content than over-ripe or green fruit. The latter contained more linalool which apparently esterified with maturation.

Lavender Reinforcer

"Lavender Reinforcer R.P.," a new development in the field of essential oils, is now being produced by Rhodia, Inc., New York. The compound is based upon various ketones that are found in natural oil of lavender and these ketones contribute an important odor factor. Addition of three per cent of "Lavender Reinforcer R.P." benefits any kind of lavender; high ester products have more tenacity and low ester oils are greatly improved. It is particularly recommended for soap, where lavender and lavandin are used.

Cordex

Greater relief of symptoms in mild to moderate cases of rheumatic disease is provided with a new drug combination now being produced by The Upjohn Company. Called Cordex, the preparation combines prednisolone, with acetylsalicylic acid and offers both anti-inflammatory and analgesic action.

Cordex is more effective than either drug alone in the amounts employed, for tests suggest an added anti-inflammatory effect is produced by the combination. By requiring less steroid to effect a therapeutic response the chances of undesirable side effects are lowered, permitting effective therapy for prolonged periods usually required in rheumatic disease.

(*Continued from page 838*)
sations could be made for the oily matter, a certain amount of which is desirable, the woman would think the oily type the better.

DEVELOPMENTS IN COLLAPSIBLE METAL TUBE PACKAGING

(*Continued from page 781*)
lead waxed tubes were born. Incidentally, these waxed lead tubes survived, and are very widely used today, instead of the tin which they replaced at the beginning of World War II. These American tube waxing machines are used in almost every country in the world where collapsible metal tubes are manufactured.

During the early war years, our industry retained the services of Battelle Memorial Institute. Every conceivable metal alloy that was not utterly ridiculous was tried for the manufacture of tubes. Various plastic tubes were attempted during this period in our Battelle program, but the plastics industry had no polyetheylene, saran, or vinylite in 1942.

With this background, let me dwell for a moment on the impact of pharmaceutical research on the collapsible metal tube.

It was discovered by one of your eminent research men that aqueous-base ointments penetrated the human skin at least seven times as effectively as the petrolatum-base types which had been standard for many, many years. However, these aqueous ointments also penetrated our collapsible metal tubes, whereas there had never been a problem of any importance with old style ointments. Even our best waxes could not contain some of these new ointments, although these waxes were applied to chemically inert pure tin tubes.

The problem was finally solved by application of the vinylite and phenolic base lacquer linings that had been the object of considerable research in the laboratories of a number of metal tube manufacturers. The use of these lacquer coatings has been greatly expanded in the past few years. We have progressed from our early vinyls and phenolics to the epoxy resins. We are trying hard with the help of the paint industry to find the ideal coating with unlimited product resistance, perfect adhesion, and satisfactory ease of application.

Also, some new and highly efficient wetting agents have come out of the laboratory in recent years and have become commonplace. These, too, have posed some difficult problems because they are so active chemically, and have produced some interesting mysteries. Two nationally known pharmaceutical products which were packaged in unlined tin tubes in the early forties now must have a wax liner, even though the manufacturers sincerely believe and stoutly maintain that the formula has never been changed.

We know that the goal of the research chemist in the pharmaceutical and toilet goods industries is to develop better and more effective products (the ones that concern us are ointments and creams) without regard to reaction on the container. We recognize this situation, we have met it, and we are striving constantly for container improvement.

During this same period of great research effort of the pharmaceutical industry, and while our tube industry carried on its program with Battelle on metals and other products, several of the large tooth paste and shaving cream manufacturers were also hard at work on a program of vital importance to them. If they learned to control the Ph of their products, and if they could also find the proper inhibitors, tooth paste and lather shaving cream could then be packaged in much less expensive unlined aluminum tubes.

It had never been done before—lather shaving creams and tooth pastes had always been destructive to aluminum. This possibility was particularly desirable since they could no longer afford to use tin as it had increased greatly in price since before World War II. Also, they preferred aluminum tubes because their appearance was better than waxed lead or alloy tubes. The Colgate-Palmolive Company was the first of the large tooth paste and shaving cream manufacturers to develop new formulae that were compatible with unlined aluminum, and thereby saved, with the prevailing costs of that period, between one and two million dollars per year on collapsible tube purchases. This effort was truly worthwhile. Other large manufacturers also solved this problem shortly thereafter.

Before we leave the question of research, I should like to take this opportunity to answer a question that has frequently been asked of tube manufacturers. It is: "Why don't you make odd shaped tubes such as oval, or square?" The answer is that such tubes were extruded for the first time thirty or more years ago. It is an interesting fact that we can control the dimensions of a cylindrical tube with a great deal more accuracy during extrusion process than these odd shapes. The wall and shoulder uniformity are much greater in a round tube, and the tube is much stronger. Also, these odd shapes could not be decorated with any available printing equipment.

We have now discussed enough of our past problems to proceed logically to recent developments in the collapsible metal tube industry. We discussed earlier the expansion of inside liners of various types and our constant effort in that direction. Now, a virtual revolution has taken place in recent years in the field of *outside coating enamels* and printing inks. Until approximately ten years ago, most of the industry had used oleo based enamels. The whites of these enamels were perfectly beautiful for a good many months, but then they gradually became yellow. This was a more or less graciously accepted evil—there was nothing better. Product resistance of these oleo based enamels was not good by today's standards, and required the use of outside varnish or lacquer for additional protection of most tubes.

Since 1945, however, we have been almost submerged by the paint industry in a flood of new enamels

(*Continued on page 846*)

The

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Stable, economical and versatile, the Mayas are invaluable in maintaining a given fragrance throughout a line or related products such as a cream, cologne, powder, rouge, soap, etc.

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- Our best wishes for a very successful and prosperous New Year

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AEROSOL SERVICE

Announcement

The Polak & Schwarz Research Department has concluded its research in the field of Aerosol. The experience gained is available to Aerosol Manufacturers.

Pending these investigations Polak & Schwarz refrained from any activity in this sphere. They now wish to draw the attention of interested parties to the services they can render in the whole field of Aerosols from propellent to active ingredient and from container to perfume.

POLAK & SCHWARZ

POLAK & SCHWARZ, INCORPORATED, 667 WASHINGTON ST., NEW YORK 14, N. Y.

(*Continued from page 842*)

—vinyls, alkyds, combinations, and epon-based coatings. These new coatings showed greatly improved characteristics—but we had innumerable problems until we learned how to use them. Heat and drying cycles were vastly different from old enamels, but after frequent modifications, and very close cooperation with paint manufacturers, we know that they are much more efficient and reliable than the old ones. The vinyl enamels are perhaps the most widely used coatings at the moment. Covering power has been greatly improved, adhesion is excellent when properly applied and, importantly, the whites stay white indefinitely and many of them will withstand steam sterilization.

Removable enamels, for use on prescription tubes, in the pharmaceutical industry, are variously known as Ready-Peel, peel-coat, strip-coat or peel-off enamels (figure 3). They have saved the industry at least several hundreds of thousands of dollars a year in labeling costs.

Druggists attending the recent National Association of Retail Druggists meeting in Atlantic City termed the development of strippable lithography as "the most outstanding advance since the invention of the tube itself."

Many printing inks now have such excellent resistance against attack by product, that it is possible to omit the relatively costly final outside coating of lacquer which, until a year or two ago, was a "must." Today's printing plates, as used in our industry, are made with such precision that the unbelievably sharp and clean print will withstand the sharpest scrutiny.

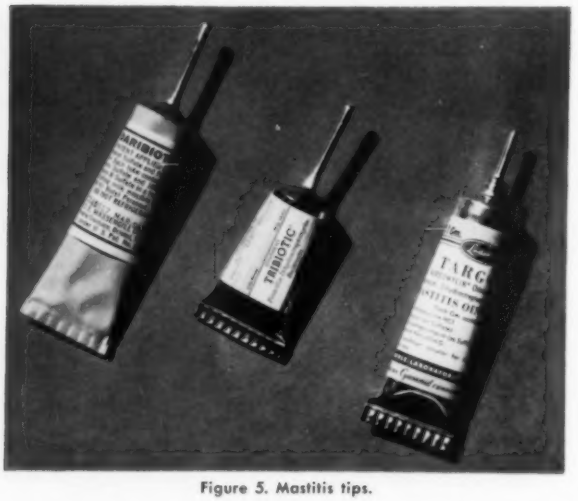

Figure 5. Mastitis tips.

It is difficult to be modest over an achievement that has been so generously hailed by the great dairy industry, and by the Department of Agriculture, as one of the greatest forward strides of this century in veterinary medicine—I speak of the development of the mastitis tube! Until 1949, when this tube (figure 5) was first created by our industry, the scourge of mastitis in milch cows cost the farmers of our country almost one quarter billion dollars per year.

As many of you know, mastitis is as prevalent in cows as the common cold is in humans. It was unusually hard to cure, and many thousands of otherwise healthy cows were slaughtered each year until some very distinguished members of the pharmaceutical industry developed ointments that could control and often cure this plague in one application. This ointment, however, must be administered into a tiny teat canal by a tin collapsible tube whose tip resembles a heavy hypodermic needle.

The tip of our mastitis tube is one inch long, has an orifice of thirty to thirty-five thousandths of an inch and is of necessity very smooth, and an outside diameter of approximately 93-1000ths of an inch.

When we first had the opportunity to get acquainted with polyethylene in 1949, our industry

Figure 6. Polyethylene caps for tubes.

quickly saw its potential for collapsible tube closures (figure 6). The elastomeric qualities of this excellent material and its tendency to shrink slightly, make it possible to produce a cap that would literally hug the neck of a tube. This banished forever the problem of caps loosened in transit, and also the resultant leakage of filled tubes, when caps were so loosened. We did not wait for material manufacturers to urge this product on us, but our industry before 1950 had shown the initiative to invest over one hundred thousand dollars in molds for the production of polyethylene caps. All of these caps are of ample weight and thickness to prevent product seepage. These caps are much too heavy to be permeable, and most of them are designed to withstand the heat of a waxing machine.

Also, the first pile pipes of polyethylene (figure 7) were made by our industry and today, virtually all pile pipe production is of this flexible material. I am told that customer complaints of injury as from the old fashioned rigid pipe that had an occasional sharp fin, have been virtually eliminated.

Another new development that has been very suc-

(*Continued on page 849*)

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Industry's Books...

Drying and Dehydration of Foods, *by Harry W. von Loesecke, Formerly: Research Chemist, General Electric Co., Second Ed., Reinhold Publishing Corp., New York,* (1955), *300 pp., Cloth,* **$7.50.**

In this book you will find the facts necessary for successful operation of dehydration projects, both large and small. It stresses specific details, such as moisture content, time and temperature of blanching, yield to be expected, trimming losses and similar problems for all types of fruits, vegetables, meats and fish, as well as a complete chapter on dairy products.

Atopic Dermatitis, *Edited by Rudolf L. Baer, M.D., Associate Professor of Clinical Dermatology and Syphilology, New York University Post-Graduate Medical School, 122 pp., Pocket size, J. B. Lippincott Co., Phila., (1955), Cloth,* **$2.50.**

Numerous articles about atopic dermatitis have been written in medical journals and in textbooks of dermatology, allergy and pediatrics. There is no complete agreement on all aspects of the atopic dermatitis problem among the several authors of this book. However, publication of these differences in viewpoints will serve the useful purpose of enabling the reader to become better acquainted not only with the existing knowledge but also with the unresolved features of atopic dermatitis.

Hydrogen Peroxide, *by Walter C. Schumb, Professor of Inorganic Chemistry, Charles N. Satterfield, Associate Professor of Chemical Engineering, and Ralph L. Wentworth, Industrial Liaison Officer, Massachusetts Institute of Technology, (American Chemical Society Monograph Series No. 128, 1955), Cloth,* **$16.50.**

Here, for the first time in English, is a comprehensive, book-length treatment of the manufacture, properties, technology and uses of hydrogen peroxide. The book begins with the history and technical development of hydrogen peroxide, followed by descriptions of present-day and potential methods of manufacture. Subsequent chapters discuss such important topics as purification and handling; physical, thermodynamic, electrical and chemical properties; molecular structure and asociation; catalysis and reaction mechanisms; stability; methods of qualitative and quantitative analysis; and uses of hydrogen peroxide including bleaching, oxidation and as a source of energy. The final chapter deals with the preparation of inorganic peroxides and superoxides and describes the metallic and non-metallic peroxy compounds, peroxy acids and salts.

Atomic Energy Research at Harwell, *by K. E. B. Jay, 144 pp., (1955), Philosophical Library, New York, (1955), cloth,* **$4.75.**

This describes the work done at Harwell between 1951 and 1954, and, in addition, changes in the regulations about the release of secret information have made it possible to discuss in more detail some of the subjects which were only mentioned in general terms in the earlier book—("Harwell—the British Atomic Energy Research Establishment").

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(Continued from page 846)

cessful, is our aluminum aerosol can. Because our raw material is more expensive than steel, we cannot match costs, size for size, with beer cans or fly sprays. However, we are producing a small can that contains approximately two and one-quarter ounces of material, a size perfect for feminine handling and particularly for beauty kits. It is very decorative and feminine in appearance, looks well on a dressing table and fits well in medicine cabinet. This can is gaining wide use for anti-perspirants, leg make-up, hair lacquer and has other cosmetic applications. The pharmaceutical industry has shown interest in it for medicinal foot sprays, protective lacquer sprays for bandages and casts. It offers vast possibilities, limited only by the imagination of you packaging men.

Figure 7. Pile pipes made of polyethylene.

We shall pass lightly over the development of scratch-brushed shoulders of aluminum tubes. They are quite decorative and some of our cosmetic customers prefer them. There has been some revival of interest in the enamel-coated shoulder that some of you saw for the first time during World War II—a development to make the lead shoulder more attractive.

Our entire industry has now converted to the use of Carboloy tools and dies for the manufacturer of aluminum tubes (figure 8). Many manufacturers also use them for soft metal production. These tools have led to more rigid quality controls, especially relating to wall thickness, tube diameter and shoulder thickness.

You can be sure that we are aware of the necessity of being constantly on the lookout for new processes that are practical, and new materials that are better. There is an exploratory program in automation under way in many tube plants. It is less spectacular than in the automotive industry, to be sure, but it is designed to minimize human handling and human error. As in the automotive industry also, this move toward automation has not thrown anyone out of a job.

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and pharmaceutical field to make the metal tube of even greater usefulness, we are continually conscious—as we know you are, too—of the need for maintaining

Figure 8. Step in production of aluminum tubes.

and enhancing the basic qualities that have made this tube a preferred container for dispensing the ointment form of drugs.

These basic qualities of a container for the dispensing of pharmaceuticals are: (1) It must be nonporous and keep harmful air and light out and essential oils in; (2) It must be sanitary and permit the safe use of the packaged product by more than one person; and (3) It should be non-refillable to avoid possible serious consequences to the user.

SEBACEOUS GLAND SECRETION

(*Continued from page 761*)

male sex hormone: animal experiments, in which rats were treated with testosterone propionate, showed that testosterone has indeed a powerful stimulating effect on the growth of sebaceous glands. In human males, the absence of male sex hormones, as in children with undeveloped secretory sex organs, leads to reduced skin and hair oiliness, but these patients, who do not spontaneously develop seborrhea or acne, will do so when treated with testosterone. Moreover, normal males and females may develop acne, associated with overdeveloped sebaceous glands, if they are treated with excessive doses of testosterone.

In females, however, the relationship between hormones and sebaceous gland secretion was not clearly defined, although, as mentioned above, secretion and development of the sebaceous glands is about the same in both sexes. The male sex activity of adrenal gland hormones was at first thought to be responsible for sebaceous gland development in females, but for a

(*Continued on page 853*)

Trade Literature

Evans Research Brochure

Evans Research and Development Corporation, 250 East 43 Street, New York 17, has issued an informative new brochure outlining the relationship between independent consulting laboratories and industry. The pamphlet answers typical questions often raised by prospective industrial clients and tells how Evans Research cooperates with industry in solving diverse problems.

Lauryl Alcohols

Rohm & Haas Company, Washington Square, Philadelphia 5, has available technical information on, as well as samples of, two new lauryl alcohols, Dytol J-68 (containing 80 per cent of C_{12} alcohol), and 95 per cent Lauryl Alcohol. As anti-foaming and emulsifying agents, these chemicals are said to be of interest in many fields.

Kinetic Dispersion Corp.

Kinetic Dispersion Corporation, 95 Botsford Place, Buffalo 16, N. Y., has issued a 16-page booklet giving complete information on its line of Kady Mills.

The company has also issued a bulletin (F-8780) on methyl n-butyl ketone, giving physical properties, specifications, shipping data, and applications.

Stokes & Smith Folder

Four basic methods of auger filling are described and illustrated Folder P-802 issued by Stokes & Smith Company, 4992 Summerdale Avenue, Philadelphia 24, and describing the Stokes & Smith Model EG-1 Universal Auger Filler. The machine, an improvement on earlier models, provides a choice of volumetric set-time filling, pressure packing, gross weighing or combination auger-vacuum filling.

Adipic Acid Bulletin

National Aniline Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, has issued Technical Bulletin I-12, which is an eight-page booklet on adipic acid. It covers the six basic reactions of the carboxyl group and eleven basic reactions of the alpha methylene group.

Linde Organo-Silicone Compounds

Linde Air Products Company, a Division of Union Carbide and Carbon Corporation, 30 East 42 Street, New York 17, has available an eight-page data sheet describing six new organo-silicone compounds with unusual lubricating and solubility properties. Since these products possess many properties which hitherto have not been available in silicones, it is expected that they will find ruse in cosmetics, as well as products of other industries.

Carbide & Carbon Booklet

Carbide and Carbon Chemicals Company, 30 East 42 Street, New York 17, has issued a new 36-page booklet (Form 4410D) on the Columbia carbon system of solvent recovery. The booklet gives technical data on activated carbon and describes the efficiency and economy of recovering solvent vapors in a variety of industries. Complete recovery plants with capacities from 50 gallons a day to over 100,000 gallons are designed for specific requirements.

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An Amerchol such as the multi-sterol, liquid **Amerchol L-101** enhances softening, penetrating and spreading activity while holding desirable moisture to the skin. The surface active Amerchols function at the interface in oil-in-water emulsions to bring about these unique effects on skin and hair.

The Amerchols are ideal ointment bases since they are stable, induce rapid drug release, and promote optimum healing rates.

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Readers' Questions . . .

Electric Pre-Shave Lotion: *Can you help me in the formulation of a lotion to make electric shaving more comfortable?* CHICAGO

Two types of preparation are possible for the purpose you mention. In the first, the action depends upon mild astringency to make the individual hairs of the beard stand up a little straighter and thus be more easily reached by the cutters. A useful starting formula is the following:

Zinc sulfate	**0.5**
Alcohol	**40.0**
Sorbitol	**5.0**
Water	**54.0**

Add color and perfume to suit. In some preliminary experimental formulas of one of these products, I tried the action of much larger quantities of astringent and found that there was enough action on the skin so that the hair actually was below the skin surface and could not be reached for cutting. The astringent action should be kept at a relatively low level.

The other type of preparation is primarily an emollient and consists of an aqueous-alcoholic solution containing very small proportions of cetyl alcohol, lecithin, castor oil or other suitable compound, again colored and perfumed as desired.

Dandruff Lotion: *Do you have available an up-to-date formula for an effective, medically tested preparation useful in treating dandruff?* MEXICO CITY

A salicylic acid lotion is given in "A Formulary for External Therapy of the Skin" by C. N. Frazier and I. H. Blank that is suggested for the treatment of mild scaliness of the scalp:

Salicylic acid	**1.0**
Polysorbate 80	**3.0**
Isopropyl palmitate	**3.0**
Isopropyl alcohol	**70.0**
Water to make	**100.0**

Hair Dressing: *I wish to modernize my hair dressing formula and use some of the newer raw materials; I would therefore appreciate any suggestions you may have to offer along these lines.* ST. LOUIS

The type of compound that comes to my mind that is being used in hair dressings is a synthetic lubricant, available in a number of grades under the general trade mark of "Ucon" fluids and lubricants by Carbide and Carbon Chemicals. These are available as water-soluble and water-insoluble grades and should repay investigation.

(Continued from page 850)

number of reasons this belief was not tenable. After earlier work had given negative results, recently it was proved that progesterone, a female sex hormone with a function and activity different from that of the estrogens, was indeed able to cause the growth of sebaceous glands. Large doses in rats caused almost a fourfold increase in the size of the sebaceous glands in a short time; even microgram doses for a longer time will cause an 80 per cent increase in sebaceous gland size.

The above factual material has been largely abstracted from S. Rothman, "Physiology and Biochemistry of the Skin."

There is no point in leaving the discussion at this point, however, since a direct cosmetic research application seems apparent.

Dry skin correction is a major goal of cosmetic formulation and this has long involved the use of emollients. In Blank's theory, skin dryness is caused by loss of water, not oils, yet the use of oils as occlusive layers to prevent loss of water is a natural consequence of the theory. A limited increase of sebaceous gland size and activity to produce added quantities of natural skin fats and oils should certainly be helpful. The male sex hormone, testosterone, is obviously unsuited for use in a cream used by women; progesterone, however, is another matter.

Progesterone, although an essential female sex hormone, has a low order of activity in terms of the size dose required and it has a rather wide dose range within which it can be administered with little or no side reactions. Subject to a research program proving its ability to be absorbed by the intact skin, to act locally on the sebaceous glands without being absorbed to an appreciable extent into the blood stream and lack of harmful activity when used on either intact or broken skin, progesterone may well prove to be a useful ingredient in creams to correct excessively dry skin. The hormone itself is lipid-soluble and should therefore be absorbable to some extent by the intact skin; moreover, it should be relatively easy to incorporate in oily, occlusive creams that in themselves should have some value in combatting dry skin.

PHARMACEUTICAL PATENTS

(Continued from page 772)

he is charging the price he must charge to make a profit, or he is charging the minimum price at which the manufacturer allows him to sell his product under fair trade. But it is not only the ones who question the druggist who disturb him, it is the many people who say nothing but go away convinced that he charges too much and then never come back.

The patent situation is a problem which the industry will have to solve if the industry is to continue to enjoy its excellent reputation as a most important factor in the improvement of the health of our people.

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The MODIFIED LANOLIN with new properties.

Modulan is chemically treated lanolin containing all the constituents of lanolin modified by a unique treatment to impart NEW and VALUABLE PROPERTIES.

Modulan forms clear solutions even in cold mineral oil and deposits hydrophobic, emollient films on skin and hair. These desirable protective films are waxy rather than tacky and are very pleasant to the touch.

Modulan is extremely hydrophobic – does not form greasy emulsions and is practically odorless. Because of its outstanding compatibility with oil-in-water emulsions and with soaps and shampoos, Modulan is particularly recommended for use in creams, lotions, baby products, hair preparations, make-up, and ointments.

CLINICAL INVESTIGATIONS HAVE INDICATED THAT MODULAN IS HYPO-ALLERGENIC.

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Much damage to the industry can result from a realization by the public that a jungle situation exists among these pharmaceutical manufacturers whom they have always considered as fine, highly reputable houses, who are ethical in every respect. They might not be shocked at this sort of thing existing among other manufacturers whose goods they buy and use, but they are shocked to think that it exists among those who make the drugs which they use in serious diseases.

PLAX REVIEWS ITS PROGRESS

(Continued from page 784)

Some of the advantages of polymethylene are its rigidity, its ability to withstand high temperatures, such as live-steam sterilization required in the pharmaceutical field, and resist cracking at temperatures far below freezing. It is believed that this material will find considerable use in aerosol bottles whose sides must be rigid enough to withstand internal pressures.

Polymethylenes seem to prevent the transmission of water vapor, a factor which might allow certain antibiotics to be packaged in this type of container.

Variable temperatures encountered during shipment would not affect the polymethylene packages or promote breakage through high or low temperatures.

Many types of packages and plastic materials were demonstrated, which were made possible by the development of new machinery to form and fabricate polystyrene sheets. This transparent material, called Polyflex, is used for see-through lids for paper containers—like cottage cheese, potato salad and cole slaw.

It is odorless, tasteless, non-toxic and will withstand freezer temperatures, can be printed, embossed and colored.

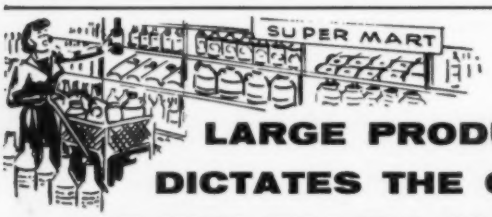
Polyflex is toughened by stretching it in two directions. This brings the jumbled mass of molecules into more orderly patterns and in closer alignment to the directions of stretch. As a result, there is an increase in tensile and impact strengths, permitting extremely thin gauges of oriented polystyrene to be used in place of much heavier gauges of unoriented material.

Looking into the future, Mr. Elder predicted that as time goes on plastics will decrease in price owing to economies in production and molding, along with the growth of the industry.

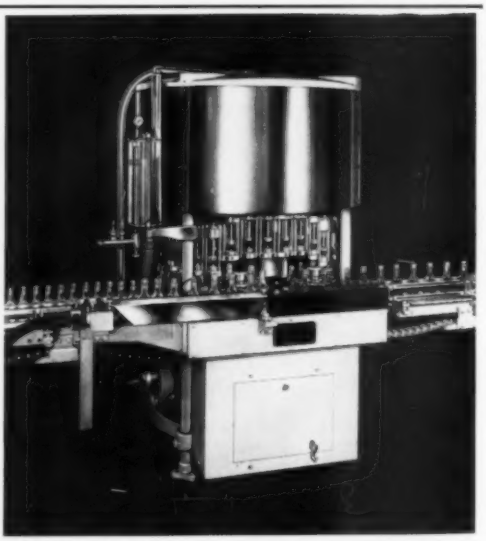
There will be a greater development in coatings and laminations, and bottles with linings, he feels, will outsell plain plastic bottles, judging from the fact that 85 per cent of the cellophane used for packaging is incorporated with coatings and laminations of various types.

Plastics will become more versatile as fabricators resort to additional alloys of plastic materials, such as polyethylene and polymethylene—to achieve different properties.

From now on, the trend will be toward more visible



LARGE PRODUCTION DICTATES THE CHOICE OF THE FILLING MACHINE



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It will pay you to learn what two generations of liquid filling engineering experience can contribute to your operation. Learn, too, how U.S. automatic liquid filling equipment can be custom-engineered to your requirements, at a substantial end saving over a standard machine.

For recommendations or quotations, please specify product, size and type of container and desired fill per minute, hour or day. For details of the machine, write for Rotary Filler Bulletin.

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U. S. Model B-49 Straight-line Vacuum Filler; the most automatic one-man filler. Operates with or without discharge conveyor. For all types of liquids. Easy changeover for all types of containers. For full details, write for the Model No. B-49 Bulletin.

U. S. Model B-2 Semi-automatic Vacuum Filler. Provides efficient continuous production, filling two containers at a time. Automatic product supply for all containers up to 4½" dia. All liquids and semi-liquids. Portable. Write for the B-2 Bulletin.

U. S. Siphon Filler. Efficient for all liquids including foamy products or products that do not permit agitation. Stainless steel tubes; acid resistant glass lined tank. Improved model. Adjustable, simple, accurate, dependable. Write for the Siphon Bulletin.

packages through the use of plastic materials.

Other speakers were Robert A. Glaenzer, vice-president of sales; C. Paul Fortner, vice-president, research and development; C. N. Sprankle, sales manager, film and sheet division; and John W. Carlisle, market development manager.

CETYL ALCOHOL

(Continued from page 769)

3. *Cold Cream*

Cetyl Alcohol	2.0
Lanolin Anhyd.	5.0
Paraffin	43.0
Olive Oil	4.0
Rose Water	46.0
Ottar of Rose	0.1

The rose scent is by way of suggestion; of course, suitable other scent substitutions could be made.

4. *Ointment Base* (washable)

Cetyl Alcohol	2.5
Stearyl Alcohol	2.5
*Ceramol	15.0
Propylene Glycol	10.0
Petrolatum	30.0
Water	100 c.c.

Ceramol, (a brand name of Lanette Wax SX, originally introduced in Europe), is included as the preferred form of adding a sodium alkyl sulfate emulsifier. This unique product, a partially sulfated cetyl-stearyl Alcohol, avoids the dustiness of sodium lauryl sulfate.

*Aceto Chemical Co., Inc.

5. *Ointment Base* (washable)

Cetyl Alcohol	20.0
Glyceryl Monostearate	20.0
Spermaceti	10.0
*Span 20	10.0
*Tween 20	10.0
Glycerine	12.5
†Amerchol CAB	20.0
Preservative	q.s.
Water	100

*Atlas Powder Company.

†American Cholesterol Products Inc.

Recently, cetyl alcohol was reported as an excellent emulsifier for use in combination with quaternary ammonium compounds in cosmetics.[13] This compatibility is readily understandable, since cetyl alcohol is non-ionic. Emulsifiers of the anionic variety often used in cosmetics, such as sodium lauryl sulfate, would not be compatible with a cationic quaternary compound. If 7.5 per cent cetyl alcohol is used with 0.5 per cent to 2.0 per cent of a quaternary, no other emulsifier is needed, and the product exhibits excellent storage qualities.

Cetyl alcohol is also used in the manufacture of a number of the quaternary ammonium compounds

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themselves. Compounds of the general types that can conveniently be called cetylalkylaryl-ammonium halide or cetyl pyridinium halide are examples. More specifically, cetyl dimethylbenzyl ammonium chloride, cetyl trimethyl ammonium bromide, cetyl pyridinium chloride and bromide are but a few in use. These quaternaries are excellent germicides and fungicides.

Cetyl alcohol is also used in the manufacture of sodium cetyl sulfate, employed as an emulsifier, detergent, foaming agent, and dyeing auxiliary. It is not as as widely used, however, as its analogue, sodium lauryl sulfate.

Cetyl alcohol is also used in organic syntheses, particularly to make cetyl chloride, bromide and iodide which are employed as starting materials for other syntheses.

Recently, Cetyl alcohol's interesting properties found a new commercial application. A monomolecular film of Cetyl alcohol has been found to substantially reduce the evaporation rate of water in reservoirs.[11] Among the various fatty alcohols tried, Cetyl Alcohol worked best. By way of application, small pellets of Cetyl Alcohol are floated on the surface of the water in metal baskets, and the thin film thus formed is instrumental in the conservation of millions of gallons of water than would otherwise be lost from the reservoir by evaporation. This is of particular importance in areas of seasonal rainfall or water scarcity, such as tropical and semi-tropical climates.

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RESEARCH IN THE PHARMACEUTICAL INDUSTRY

(Continued from page 767)

cologic tests on animals. By these means we learn something of how the drug acts and we gain an indication, but not a final answer, as to its worth in human medicine. The indispensable tests on animals must include acute and chronic toxicity experiments to learn whether the compound may produce deleterious side effects if it is given briefly or for an extended period of time. Often these trials are carried through several generations of lower animals to make sure that there is no genetic or other effect on the offspring.

When such extended experimentation has been completed and the new product has given promise of value, cautious clinical trial is begun. The use in humans is then increased in scope, as more experience with the drug gives added confidence that it is sufficiently safe to use.

The number of cases needed to give assurance of its value and safety depends on the specific product in question. Some drugs are inherently more safe than others, and some physiologic responses are less definite so that more cases are required to give the therapeutic evidence that is wanted.

To be used in humans, the product must be put into an adaptable form such as a tablet, elixir, solution, or injectable medium. It may have to be suitably diluted, its pH adjusted, or protected from the gastric juice, or a dozen other things done to it. This is the job of the pharmacist. Besides making sure that the product is acceptable to humans, he must also see to it that the form in which it is supplied is sufficiently stable so that it can be kept on the druggists' shelf or in the home medicine cabinet for at least a year or two. Also, standards for identity and purity must be developed, and suitable analytical procedures worked out.

When all this work has been done, the organized data may be submitted to the Federal Food and Drug Administration for permission to market the new product. If your data are adequate, and if all goes well, within a few months you may be given clearance to market it. In the meantime, your manufacturing process should have gone through the development or pilot plant, to make sure you really know how to produce the new drug at a sufficiently low cost. Then you are ready for the manufacture and distribution of the product, which you hope will be sufficiently superior to enable you to recover all your development costs and make a profit so that you can undertake research on other new products.

If people in the drug manufacturing business could just be fairly sure of the outcome of their research, our lives might be much simpler. Unfortunately, the cells of man and of bacteria are so complex that we can not predict with accuracy what kind of result we are going to get from a given new chemical compound. Some good guesses can sometimes be made, but if we can end up with one good drug out of each thousand compounds we make and test, our batting average may be about normal.

For this kind of intensive and painstaking research it is necessary to have the attention of chemists, physicists, bacteriologists, pharmacologists, pharmacists, clinicians, and other scientists working as a team, with each mashing his own specialized knowledge with that of the others. Such programs of research have led to most of the anesthetics, vitamins, antihistamines, pain-relieving drugs, vaccines, hormones, sulfa drugs and antibiotics, on which we rely so heavily for our health and life. It is such research, on a still broader scale, which is needed to make further progress against cancer, heart disease, arteriosclerosis, hypertension, arthritis, and the common cold. The growing importance of some of these diseases is due to the saving of lives of younger people by better drugs, superior medical care, and improved nutrition. As a result, geriatrics, which deals with old age and

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its diseases, is assuming an important place in the attention of the scientist working in the medical field.

It is important to recognize that research of interest in the drug field is much broader than the discovery of drugs alone. In fact, such discovery is often the last step in a long progression of scientific effort. The basic work which shows how a cell feeds or multiplies or dies, or how the blood carries oxygen and nutriment, or the investigation which leads to the isolation of a crystalline virus, or demonstrates the structure of a crystal by X-rays, or proves that bacteria may be tricked into consuming chemicals that will kill them but not the host—all such basic scientific studies can have far-reaching effect on how physicians tomorrow may be treating cancer, or polio, or stomach ulcers, or something else.

Of this elusive activity called research, the drug manufacturing industry is a large user, and, in proportion to the size of the industry, one of the most important. Each drug firm of importance maintains an active research department, well staffed and equipped. The number of research personnel in many of these firms runs into the hundreds. To pay the salaries of these people and to supply them with tools and materials, in an environment conducive to productive effort, require an annual outlay of many thousands of dollars per man. Research is expensive business, but if it is imaginative and well carried out it is likely to lead to major results.

Aside from being the tool by which new drugs are discovered, research must also make them economically feasible. To cite an old but illustrative example, a dose of 100,000 units of crude penicillin in 1942 cost $20. Continuing research by microbiologists, chemists, and other scientists and engineers has steadily brought down the cost to a small fraction of that amount. In fact, a glass bottle, label, and carton may now cost more than the penicillin contained therein. Similarly, research effort has brought within financial reach of our populace other important drugs which are in use today. Research has kept drug costs in line better than has been accomplished for most cost-of-living items such as food, clothing, and housing. A study made just recently by a member of our industry indicates that while disposable income rose 262 per cent between 1939 and 1954, personal expenditures for drugs rose only 167 per cent. We should add to this the fact that today's drugs are far more effective than those of 1939; and 70 per cent of today's prescriptions could not even have been filled ten years ago because the drugs had not yet been born.

Newer drugs have played an important part in raising our expected life span to an all-time high of 68½ years. In the light of these extensive successes, is the research scientist working himself out of a job? Must he, as the wag said, quit because he discovered a cure for a disease that didn't exist?

The answer is an emphatic *no*. I have already alluded to a number of serious diseases for which we

do not yet have adequate drugs. Even for those maladies for which very effective drugs are now available, it should be possible to discover still better ones which will produce fewer reactions, be better tolerated, or cure the patient quicker. In bacterial and virus diseases, and apparently even in cancer, the offending organism may in time acquire resistance to the drug which had been effective before. Obviously, we then need something new. There is no end to the chain of health-maintaining drug products that the scientist will be called on to originate and produce.

OUR SMALLEST SERVANTS

(*Continued from page 771*)

cattle had been exposed to the air and was swarming with all sorts of unwanted organisms. Instead of throwing away the bottle, Pasteur kept it. The next day, the anthrax bacilli were gone. They could thrive in the tissues of cattle but could not survive the onslaught of certain air-borne microbes.

"These facts," Pasteur wrote, "justify the highest hopes for therapeutics."

Science and technology were not yet equal to the task of organizing microbes for warfare on other microbes. Some physicians tried treating patients by inoculating them with the germs of other diseases and got good results in many cases. But neither the public nor its doctors were prepared to accept the idea of contracting a second infection in order to escape a first.

The inheritors of Pasteur's knowledge encountered better luck when they moved outside the field of medicine and sought to use microbes as production workers in industry.

Of all the resultant research and experimentation, the most significant took place in the United States, where, in 1914 chemists of Chas. Pfizer & Co., Inc., began looking into the possibility of producing citric acid by fermentation.

The chemists worked for almost ten years and finally perfected a process by which the mold *Aspergillus niger* transformed ordinary sugar into citric acid. In 1923, Pfizer opened the world's first successful citric acid fermentation plant. The world price of the product dropped from one dollar a pound to twenty-five cents, and this country became an exporter, rather than an importer, of the useful chemical.

Parallel to the Pfizer fermentation research was that of the genius Chaim Weizmann. Weizmann, later to be one of the founders of the state of Israel, almost single-handedly rescued Great Britain from a serious ammunition shortage in World War I. He did it by using a bacterial cousin of the tetanus germ to convert corn mash into acetone, a chemical essential to the manufacture of cordite, an explosive.

Pasteur had suggested that human diseases could be cured by marshaling microbe against microbe. To avoid the risks inherent in trying to fight one disease with another, researchers looked for a chemical agent with which a microbe "friendly" to man was able to destroy disease germs. In 1901, Rudolf Emmerich

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and Oscar Low, of the University of Munich, isolated pyocyanase, a powerful germ killer, from the microbe *Pseudomonas aeruginosa*. Several hundred patients were treated quite successfully with pyocyanase. Here, then, was the world's first antibiotic, the first antiseptic chemical of microbiological origin. But it was ahead of its time. No technique existed to guarantee that each new batch of the substance would be as effective as the last. The quality controls of biochemical engineering were more than forty years in the future. Standardization was impossible, and pyocyanase was abandoned as too hazardous.

Little more was done with antibiotics until 1928, when Alexander Fleming, a bacteriologist at St. Mary's Hospital in London, had a profoundly important experience. He was trying to isolate *Staphylococcus aureus* and found that the germs were not growing as they should. A foreign substance had apparently blown through an open window and settled on the dish. A clear ring in the center of the dish showed where germs in the vicinity of the invading substance had been wiped out.

Fleming found the contaminant to be a mold of the *Penicillium* family. He nurtured the mold and then set about trying to extract the chemical with which it had killed the Staphylococcus germs. He finally managed to isolate a tiny quantity of a brownish secretion which proved to be a germicide many times more powerful than pyocyanase, the earlier antibiotic. He named it penicillin and used most of his meager supply to clear up one infected wound.

Fleming's discovery was resurrected under the stress of World War II, when Drs. Howard Florey and Ernst Chain, of Oxford University, resolved to find an antibacterial agent of wider activity than the sulfa drugs.

After months of labor, the Oxford investigators nursed enough penicillin out of Fleming's mold to prove that it was exactly what they were looking for. The drug worked wonders on laboratory animals, and it almost saved the life of a London bobby who was dying of a blood infection. The penicillin brought him out of his moribund condition to the point of recovery, but then the supply of antibiotic ran out, and the man died.

Months of work produced enough new penicillin to rescue a boy whose streptococcus infection would have yielded to no other medication. The new drug could save thousands of lives. It was needed immediately, in quantities.

Florey and his colleagues decided to try the United States, which was not at war and might be able to devote mass-production techniques to the solution of the problem.

The Britons were warmly received here. Three American companies—Pfizer, Merck, and Squibb—led the way in assigning first-rate talent and facilities to the project. United States government laboratories co-operated.

Basically, the job was to coax the *Penicillium* mold into producing more penicillin. The yield would have to be considerably greater than the one part of penicillin to one million parts of fermentation broth which Florey had been getting from his shallow dishes.

In addition, the penicillin of early World War II was as unstable and flighty a chemical as man had ever tried to handle. In this regard, it was much like its parent, *Penicillium notatum*, a mold so intractable and hard to deal with that the scientists found themselves thinking of it as having a perverse and difficult temperament of its own. Nutrients were enriched to increase the organism's activity and improve the proportion of penicillin which the organism would produce.

Meanwhile, engineering techniques were devised to protect the fermentation culture from invasion by extraneous microbes which might contaminate an entire culture or, by fighting the *Penicillium* mold, might reduce the yield. Other techniques expedited the laborious and delicate process of recovering the antibiotic from the broth in which it was manufactured.

This was progress, but it was not enough. The cultures were being grown in flasks about the size of milk bottles, and it was suddenly realized that factories larger in capacity than all the milk-bottling plants in the United States would be needed.

Fermentation chemists and engineers overcame this obstacle by learning to cultivate the mold in large aerated tanks. Luck was with them: in a Peoria market, a government researcher found a moldy cantaloupe on which was growing a new strain of *Penicillium chrysogenum*, which thrived in deep tanks and eventually gave 200 times more penicillin than Fleming's *P. notatum*.

Feeding on a newly formulated liquid composed mainly of water in which corn had been steeped, the disciplined mold produced tons of the antibiotic in time to save thousands of Allied lives. It was used in Normandy on D-day and every day thereafter. By war's end, the United States was utilizing its new discoveries and previously established industrial techniques to produce more than 7,000 billion units of penicillin a year—enough to treat seven million patients. With penicillin a success, scientists set out to find antibiotics capable of fighting diseases against which the Fleming discovery was ineffective. One method of classifying the bacteria which cause human disease is by trying to dye them with a stain named after Gram, the Danish bacteriologist. Bacteria that can be dyed by the stain are known as Gram-positive and include germs that cause boils, abscesses, pneumonia, venereal diseases, scarlet fever and rheumatic fever. Penicillin is effective against these diseases, but it is useless against the virulent Gram-negative bacteria which do not accommodate to the dye and cause diseases such as tyhpoid, undulant fever, and some types of pneumonia. Also, it is ineffective against the

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virus diseases, such as influenza, the common cold, and poliomyelitis.

Among the efforts to supplement penicillin with a new antibiotic potent against Gram-negative bacteria, one of the most energetic and imaginative was that of Professor Selman A. Waksman and his colleagues at Rutgers University. He and his students had already found four new antibiotics, which, while interesting, were not suited to human use.

The molds, yeasts, actinomycetes, bacteria, or similar microorganisms most likely to provide a new antibiotic were in the waters of lake, stream, and sea. They were on the surface of the ground and beneath it. They were in the air to a height of three miles. The needed organism might be found anywhere, or nowhere. As against trying to filter it out of air or water, soil was the most promising source.

Waksman tested thousands of soil samples, using the method suggested by Dr. Fleming's experience so many years earlier.

In 1944, Waksman announced that he had found the actinomycete *Streptomyces griseus* in the soil of a field and in the throat of a chicken. From the medium in which the organism had been laboriously cultivated, he had extracted a new antibiotic, streptomycin, which was effective not only against the Gram-negative bacteria resistant to penicillin, but against *Mycobacterium tuberculosis*, the tuberculosis germ.

Somewhere in the soil of the world, new organisms capable of producing better antibiotics were to be found; of this, science was positive. To locate and identify the essential organisms and discover the precise conditions under which they might be made to yield the vital chemicals were jobs to tax the ingenuity of the greatest researchers and technologists.

Pfizer, which has become the world's largest producer of antibiotics, perfected an ingenious screening procedure which enabled it to accomplish in months what otherwise might have taken years. To keep its research scientists supplied with material, arrangements were made with hundreds of persons known to visit distant parts of the world—air-line pilots, missionaries, commercial travelers, explorers, vacationers.

Having been carefully labeled as to origin, the soil samples were suspended in water, and the liquid was poured onto Petri dishes, so the microbes could incubate and grow. Molds which appeared promising were then allowed to grow in the presence of disease germs. Pfizer scientists saw the famous "ring of inhibition" hundreds of times a day, recognizing it as the signal that an antibiotic was at work.

Usually, the antibiotic was one which had already been discovered and either was in use, like penicillin, streptomycin, Aureomycin, and Chloromycetin, or had been rejected as too toxic for human therapy. Often, the antibiotic was new, but it failed to withstand further tests.

In 1949, a bit of earth which had been spooned up near one of Pfizer's own Middle Western plants was

found to contain an actinomycete worthy of extensive investigation. The creature was named *Streptomyces rimosus*, and the canary-yellow crystals of its antibiotic were called Terramycin.

Where penicillin combated some twenty-five diseases and streptomycin fifteen, Terramycin was found effective against almost one hundred. It hit both the Gram-positive and the Gram-negative bacteria, and it was deadly to the Rickettsia responsible for typhus and Rocky Mountain fever and to the large viruses which cause psittacosis and primary atypical pneumonia.

Within a year after *Streptomyces rimosus* was identified, Terramycin had been clinically tested and was in the hands of physicians. For comparison: thirteen years elapsed between the discovery of *Penicillium notatum* and the introduction of penicillin to medical practice; three years separated the discovery of streptomycin and its emergence as a prescription drug. In the case of Terramycin, the decisive factor was biochemical engineering, which had come into being during the American effort to mass-produce penicillin and now had reached a new level of achievement. The whole may sometimes be greater than the sum of its parts. This phenomenon, known as synergism, results from the interaction of substances. Sometimes it also can be observed among human beings. A striking example of this human synergism is biochemical engineering. Working closely with the biochemical engineer are mycologists (mold experts), organic chemists, fermentation chemists, biochemists, pharmaceutical chemists, medical bacteriologists, radiation physicists, chemical engineers, mechanical engineers, and laboratory technicians. In biochemical engineering, each of these indispensable skills retains its special identity. But, at the same time, each works smoothly with all the others, in an interplay of scientific creativity which actually makes biochemical engineering greater than the sum of its parts.

Under laboratory and factory conditions, biochemical engineering must grow and exploit microorganisms whose natural habitat is a bog or a ditch or a pasture. By modifying the temperature and the nutritive ingredients of the environment in which the microbes live, or by selecting new strains, biochemical engineering establishes the conditions under which maximum quantities of the sought-after material are produced.

An example of the scientific ingenuity and engineering precision which are routine in modern industrial chemistry is the production of acetone. Only one species of bacteria—the one discovered by Chaim Weizmann—produces acetone in worth-while quantities. And the most economical yield is obtained only after the bacterium has been put through one hundred to one hundred and fifty intricate heat-shock treatments.

Similarly, in the production of citric acid, the most efficient strain of *Aspergillus niger* does its best work

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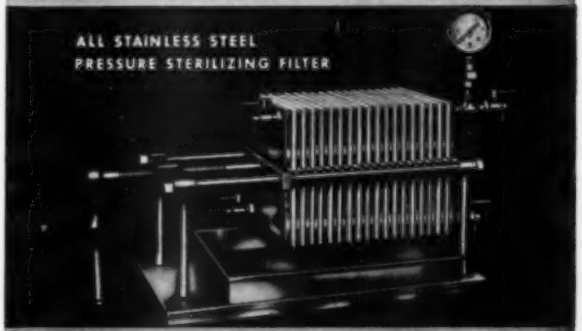

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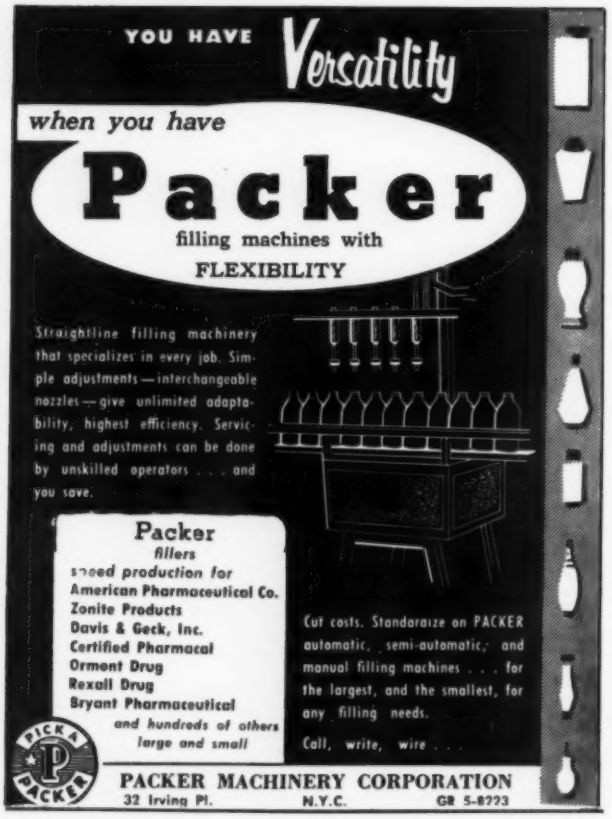
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when the fermentation is seeded with an inoculation mixture containing fifty million spores per cubic centimeter. In the ensuing process, temperature must be closely watched, the acid balance of the fermentation culture must be precisely governed, and timing must be maintained under strict control.

Closely related to all this need for superprecision and superreliability is another responsibility of biochemical engineering: the quality of the product.

Unswerving attention to quality and safety costs millions of dollars. But, by making mass production more efficient, and by expediting the search for useful new microbes, the cost of illness has been lowered and good health is a more common state of being than ever before in world history.

The biochemical engineering of vitamins is a good example.

No fewer than four of the most important vitamins are produced by fermentation processes. Vitamins B_2 (riboflavin) and B_{12} are made directly by fermentation; Vitamin C (ascorbic acid) is derived from sorbose, which is produced by a bacterium that feeds on sorbitol, prepared from sugar; Vitamin D is manufactured by ultraviolet irradiation of ergosterol, a substance obtained from yeast.

The latest development in the biochemical engineering of vitamins enables us to mass-produce Vitamin B_{12}.

On the day in 1948 when the powerful antiarthritic effects of cortisone were discovered, the world supply of that isolated hormone drug amounted to one-eighteenth of an ounce. The prospects for getting more were bleak. The raw material was a comparatively scarce constituent of cattle bile, desoxycholic acid, and the production process included thirty-seven distinct chemical steps.

Eventually, science found other methods of making the drug. While not much less costly than the old method, they were more convenient. The most remarkable was developed in the field of biochemical engineering, which now uses the enzyme systems of strictly controlled microbes to achieve intricate chemical transformations that had defied the wisdom and resourcefulness of the world's finest technologists. Thanks also to fermentation, cortisone's more powerful cousins, hydrocortisone and prednisolone, are now being produced economically. And, by a process analogous to that used for hydrocortisone, mankind now obtains the newest of the broad-spectrum antibiotics, the Pfizer discovery, tetracycline.

Of industrial chemicals produced by microorganisms, citric acid was one of the first and the historic pace setter for Pfizer. Among the newest is Pfizer itaconic acid, which shows promise in a number of industrial applications.

Ascorbic acid (Vitamin C) fortifies the vitamin content and maintains the color and flavor of frozen foods. It also increases the shelf life of beer and enhances the flavor of white wines. Oxalic acid is a bleaching agent, a stain remover, a metal and radiator cleaner and

polisher, and is used in ceramics, engraving ink, and the manufacture of photographic and blueprint papers.

Gluconic acid is an extremely mild acid used as a cleansing agent particularly suited for dairy equipment. Calcium and ferrous gluconate are used in medicines, and glucono-delta-lactone is a leavening agent used in baked goods.

Fumaric acid is an ingredient of durable plastics and brighter, faster-drying paints. Gallic acid works in leather tanning. Proteases are protein-digesting microbial secretions which degum silk, dehair hides, and prevent beer from clouding at low temperatures.

In agriculture, products of the fermentation vat are becoming more essential each year. Farmers have found that animal feeds enriched with antibiotics have an astonishing effect on the growth of livestock. Poultry and swine reach market size sooner, and on less feed. The incidence of disease is greatly reduced, and there are fewer runts.

Advances of this kind explain why, in 1954, chicken exceeded cotton as the chief agricultural product of Georgia. They also explain why the American family now enjoys turkey all year around instead of only during the winter holidays: epidemics no longer wipe out whole flocks.

TEST PANELS FOR PHARMACEUTICAL FLAVORS

(*Continued from page 763*)

are not always the best performers in subsequent tests, as shown when results cannot be reproduced in later trials. Some members who are selected for the panel should possibly have been eliminated, and others, who have been rejected, were qualified to serve. However, no instrument of measurement is perfect, least of all a panel, where the personal equation plays so great a role. Subjects for trained taste panels should be chosen who are in good health, alert, interested in flavor evaluation, and not suffering from ailments which may interfere with the senses of taste or smell. Candidates with impairment of these senses are nearly always eliminated by the triangle and duo-trio tests. Use of phenyl thiocarbamide and sodium benzoate for determination of keenness of sense of taste is a recent development of great interest.[5] The first of these compounds is said to be bitter to about seventy per cent of those who have been tested, and usually tasteless to the remaining thirty per cent. It has not been definitely established that there is a correlation between these tests and the triangle and duo-trio tests.

Conclusions reached by some pharmaceutical laboratories on flavors can be questioned because their panels have not been correctly organized. Sometimes these have not been sufficiently large to be classed as consumer panels nor sufficiently screened to be classed as trained, taste panels. To borrow a metaphor from the culinary art, they are neither fish nor fowl. When

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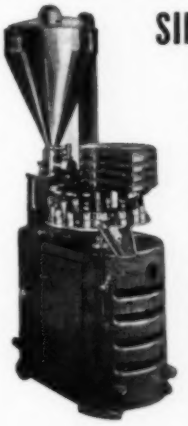

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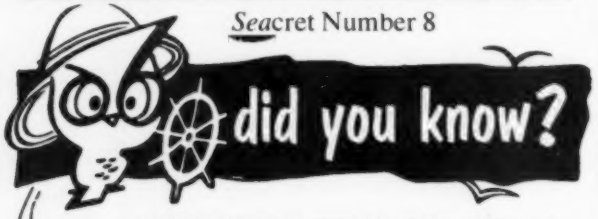

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the problem is to decide which of two flavors masks an unpleasant taste more effectively, this is really an attempt to select the more agreeable or palatable flavor; hence it becomes a question of consumer appeal. For consumer appeal tests most authorities insist that a large, untrained panel is more appropriate than a small, trained one. However, because of various difficulties that are encountered in panel tests for pharmaceutical flavors, the usual techniques employed in the food and beverage fields *must be modified considerably* in flavor work connected with orally administered therapeutic agents. In the food and beverage fields the general method is to have a small taste panel make a survey of the flavors being considered, and to eliminate those which for one reason or another are obviously ineffective or unsuitable. The final choices are left to a large, consumer panel which can have as many as one hundred members, or even more. The larger the number of members on the consumer panel, the more accurate the results, provided the panel is organized in such a manner that consideration is given to economic and social stratification, geography, age, sex, race, and other significant groupings.

It is not possible to carry out such techniques in testing pharmaceutical flavors without extensive modifications. Members of a taste panel of either type cannot be plied with flavored therapeutics day after day in the same way that members can be with foods or beverages. Where the therapeutic agents are tasteless it has been suggested that they be omitted from the formulations used for flavor testing. In this way a large number of samples can be tried without adverse results to the subjects. But there are many serious objections to this type of testing. First of all, few active pharmacological agents are tasteless.[4] Secondly, even when this situation exists, it must be established beforehand that there is neither synergistic action nor chemical reaction when the flavor and the therapeutic agent are both present. It has even been suggested in some quarters that an ingredient with great activity be replaced with one having little or no activity but possessing a similar taste. The taste of the preparation could thus be simulated without having the subjects ingest any of the active drug. This artifice is almost never practical because of the difficulty of finding two ingredients of like taste, one pharmacologically active and one inert. Furthermore, the flavor could blend with one substance or even cover its unpleasant taste, yet not the other because of unknown chemical reactions.

The best solution is to have the product tested contain the complete formulation with all ingredients present but to have the subjects taste the samples without swallowing them. Products with active therapeutic ingredients should be tested only under medical supervision and carefully controlled conditions. Sometimes, to insure safety, the medication is given in quantities just below the threshold dose. Under these circumstances it is not enough for the

panel members to be able to evaluate flavors; they must be able to project them into the realm of therapeutic dose. This is no easy matter to accomplish and explains why small, trained panels are being used in preference to large, consumer panels. It also explains why panel testing of flavors in the drug industry is still viewed with skepticism. Some pharmaceutical laboratories have little faith in panel testing; they have yet to be convinced that the time and effort consumed are justified by the results obtained. Such laboratories take the position that the development group in an efficient organization is well able to judge potential acceptability of oral pharmaceuticals. It must be pointed out, however, that in these cases the development group is acting as a panel, even though it consists of only a few members. Such laboratories are not in the same category as those which tolerate panels only "to bow to fashion," and which allow them to function without giving thought to their composition, size, or activities. In some instances there is resentment of the loss of time by workers when they are called away from regular duties to attend panel meetings. Operating under such unfavorable conditions, panels cannot be expected to offer findings of value, and they are worse than no panels at all.

Pharmaceutical chemists cannot possibly be mindful of the whims of a patient when formulating therapeutic agents but there is no reason why his wishes should be ignored in the flavoring of medicinal products. To

(Continued on page 868)

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(*Continued from page 867*)

discover just what these wishes are is the objective of consumer testing. Small, trained panels do not give the complete answer. It is a good plan to use such small, trained panels for preliminary surveys to eliminate those flavors which are ineffective or unsuitable for one reason or another, but the final choice should depend, whenever possible, on a larger panel. The ideal panel for pharmaceutical flavors is one consisting of hospital patients who have to take the remedy. It is desirable to have an equal number of men and women as subjects because taste-blindness, unlike color-blindness, is not a sex linked factor. Such groups should not be free from taste-blindness because their function is to reflect a much larger segment of the population, which to some degree is taste blind.

For all types of panal testing samples should be coded, aged for several weeks after the flavors have been added, and no findings of previous panels revealed in advance. Where the results of a hospital-patient panel agree with those of a small, trained taste panel, little is left in the way of doubt about the suitability of the flavor selected. By the same token lack of accord between the two groups should lead to a re-examination of the findings. The existence of discrepancies impels some investigators to condemn all panels and their works. A more constructive and objective attitude is to try to discover why and where the division of opinion takes place. Psychological factors should not be neglected. Jacobs gives some interesting examples.[9] Often a product with flavor *fidelity* will not be able to compete with one having flavor *strength*. Another example concerns a food product marketed as having medicinal qualities. After numerous tests, it was decided that imparting a slightly astringent taste would be in keeping with its intended use. When pharmaceutical flavors are discussed, those for dentifrices are usually included. Tooth pastes, tooth powders, mouth washes, and related oral preparations, as well as most vitamin products, are developed for the mass market. Hence, the flavors created for them must have wide consumer appeal and require extensive consumer taste-panel testing. Furthermore, there is no problem here which requires caution about an overdose of active drug ingredients. Proprietary medicines in this respect occupy a position midway between ethical drugs and mass produced dentifrices and vitamins.

Recently, emphasis has been placed on the preferences of various age groups. The young group in the United States under fourteen years consists of some forty million children. It is essential that products be prepared for them to which they offer little objection. Some manufacturers now have their pediatric medicines taste-tested by a "junior" panel. Flavors for geriatric preparations are chosen by the use of a panel of elderly people. One oral antibiotic is now cherry-flavored; another, containing sulfa drugs in combination, is custard-flavored. Chocolate-mint

blends are used in certain antihistaminics, sugar-free remedies for diabetic children, and sedatives for the young. A penicillin derivative, dibenzylethylenediamine dipenicillin G, peach flavored and attractively colored, is taken by most children without resistence. An oral fluid form of hydrocortisone in suspension has an interesting blend of fruit flavors.

Panels can make valuable contributions to the proper selection of flavors but there are difficulties which must not be overlooked. Lazarsfeld and Fiske[11] state: "When we wonder how much the very fact that people belong to a panel makes their opinions less representative as time goes on, we face an important problem." Another obstacle is that the panel method generally gives nothing but the frequencies of choices. Catell introduced the "ranking" or "order of choice" method. This system is not far removed from proportional representation in political elections, and like it, has advantages as well as drawbacks. When there are more than three choices it can become extremely involved.

For evaluating flavors in preparations containing active therapeutic ingredients, a flavor panel made up of individuals from the product development group is most safe to use. If a sufficient number of members are at the disposal of the panel group leader, he can select eight to ten of those who are most fitted for the task by the methods discussed in this paper. More extensive panel testing of flavors for such medicinals can be performed under medical supervision, using patients who are taking the remedy. When the ingredients of the formulation do not have any serious pharmacodynamic effects, it is possible to extend the size of the small, trained panel, and to use additional members from the office staff and from other personnel who may perform better in taste panel tests as shown by the results of the triangle and duo-trio tests. When the ingredients are known to be relatively innocuous, or even beneficial as in the case of vitamin preparations, modified or regular consumer panels can be formed to undertake consumer panel tests. In such cases the members of the panel are not selected because of their flavor training but because they are components of a good sample of the population which will ultimately use the medicine whose flavor is being evaluated. For this type of panel testing at least eighty to one hundred individuals are required, and they must represent the consumer population whose reactions are to be predicted. In a sense, this technique is like that of the prophetic patch test.[12]

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